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No. 1

ARNOLD ARBORETUM

HARVARD UNIVERSITY

BULLETIN

OF

POPULAR INFORMATION



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HARVARD UNIVERSITY.

THE GIFT OF

Arnold Arboretum

MAY 2, 1911

JAMAICA PLAIN, MASS.

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GRAY HERBARIUM
HARVARD UNIVERSITY

October 23, 1954

BULLETIN NO. 1.

Persons interested in plants often complain that they do not know when the trees and shrubs in the Arboretum bloom and therefore miss flowers which they want to see. To meet this difficulty it is proposed to issue from time to time from the Arboretum bulletins of popular information in which attention will be called to the flowering of important plants and other matters connected with them. During the spring and autumn these bulletins will probably be issued every Saturday and from time to time during the remainder of the year when the necessity for them exists; and in them notice will be given of what will be best worth seeing during the following week.

Copies of the Bulletin will be mailed without charge to any one interested in trees and shrubs and their cultivation who desire to receive them.

An illustrated guide to the Arboretum containing a map showing the position of the different groups of plants has recently been published. It will be found useful to persons unfamiliar with the position of the different groups of plants. Copies of this guide can be obtained at the Administration Building in the Arboretum, from the Secretary of the Massachusetts Horticultural Society on Massachusetts Avenue, Boston, from The Houghton, Mifflin Company, 4 Park Street, Boston, and at the Old Corner Bookstore, Bromfield Street, Boston.

C. S. SARGENT,
Director.

Reading
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The hot days of last week have brought out suddenly the flowers of several plants belated by the exceptional cold of the early part of April.

Many of the Magnolias of eastern Asia, which produce their flowers before the leaves appear, are now in bloom. The flowers of the earliest of these, *Magnolia stellata*, are already passing. The delicate pink flowers of one form of this handsome and hardy Japanese shrub deserve special notice. The white-flowered *Magnolia conspicua* from China, the two forms of *Magnolia Kobus* from Japan, and the hybrid *Magnolia Soulangiana* with pink flowers are particularly noticeable. They are in the immediate neighborhood of the Administration Building and near the Jamaica Plain Gate.

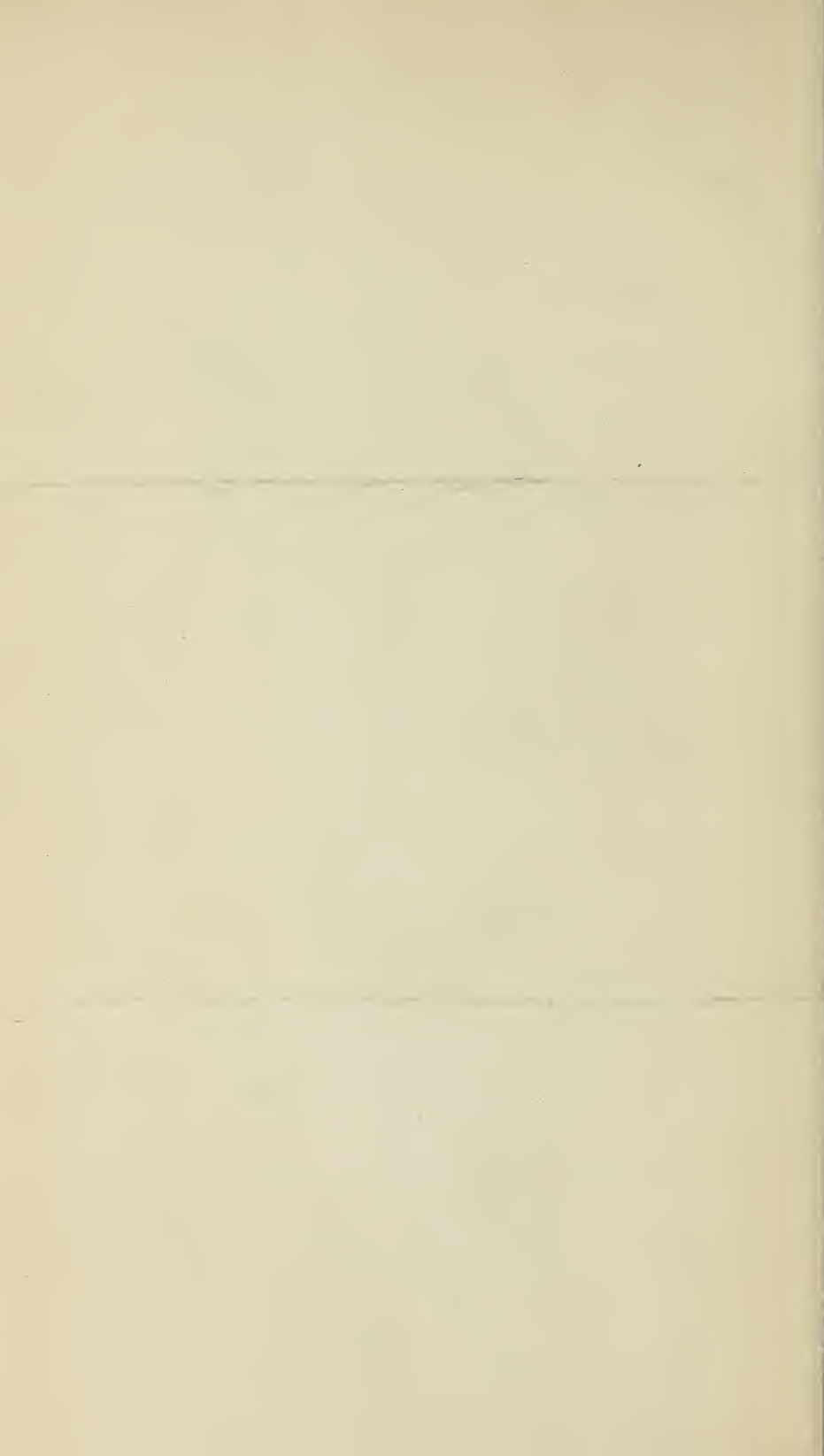
Several of the Asiatic Cherries are in bloom. The most attractive of these are *Prunus pendula* and a variety of this Japanese tree with erect branches, *Prunus pendula ascendens*, often called *Prunus subhirtella*. This is one of the most beautiful of the early spring flowering trees. Attention is called, too, to *Prunus Sargentii*. This is a large Cherry-tree from the forests of northern Japan with single flowers, pink on some plants and rose-colored on others. *Prunus Sargentii* is a valuable timber tree in its native country and one of the most desirable of the hardy trees of recent introduction. These Cherry-trees and many others are on the right-hand side of the Forest Hills Road.

In the Shrub Collection, near the Forest Hills Gate, a number of species of Ribes (Currants and Gooseberries) are already in flower and here the different forms of Forsythia may be seen. The handsomest of them at this time is *Forsythia intermedia*, a hybrid between *F. suspensa* and *F. viridissima*, and a more desirable decorative plant than either of its parents. Less beautiful but of particular interest to students of plant geography is *Forsythia europæa*, discovered a few years ago in Albania and the only species found beyond the limits of the Chinese Empire.

On Azalea Path a number of plants of *Rhododendron mucronulatum* are now in good condition. This is a native of the mountains of northern China, and is now covered with bright rose-colored flowers which are produced before the leaves. It is the earliest of the Rhododendrons and Azaleas to bloom in the Arboretum.

The Service Berry, or Shad Bush tree, will soon be in flower. Two species, *Amelanchier canadensis* and *A. obovalis*, grow naturally in the Arboretum, and the latter has been planted in large numbers through the border shrubberies. Large plants of *A. canadensis*, easily distinguished by the deep red color of the unfolding leaves, are growing at the foot of the wooded slope near the junction of the Forest Hills and Meadow Roads.

The Plum-trees near the Shrub Collection will soon be covered with sheets of white flowers. Some of the Apricots here are already in bloom, and the pink petals of *Prunus Davidiana* are already dropping. This is the Wild Peach of northern China, by some botanists believed to be the plant from which the cultivated Peach has been derived.



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No. 2

ARNOLD ARBORETUM

HARVARD UNIVERSITY

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HARVARD UNIVERSITY.

THE GIFT OF

Arnold Arboretum

MAY 10, 1911

JAMAICA PLAIN, MASS.

BULLETIN NO. 2.

One of the most interesting trees now in flower in the Arboretum is *Cercidiphyllum japonicum*. This is a native of Japan and of western China. In the forests of the northern island of Japan it grows to a larger size than any of the other deciduous-leaved trees of the Empire, often attaining a height of one hundred feet with a cluster of stems eight or ten feet in diameter. In very early spring the nearly round cordate leaves are a deep bronze color and before they fall in the autumn they turn to clear bright yellow. The flowers are inconspicuous, and the male and female flowers are produced on different individuals. They are furnished with a small calyx but are without petals and are nearly hidden by the half-grown leaves. The male flowers are composed of numerous stamens with long slender filaments and in the female flowers from four to six small carpels are found which later develop into dry pod-like fruits. *Cercidiphyllum* has proved a very hardy and generally satisfactory tree in eastern Massachusetts where it was introduced by the Arboretum about thirty years ago. A number of plants can be seen on the Meadow Road not far beyond the Administration Building. In the group on the right-hand side of the road there is a male tree now in flower.

Another Japanese plant of the same family, *Euptelea polyandra*, is flowering in the Arboretum for the first time. This is a much smaller, less desirable and less hardy tree than *Cercidiphyllum*, although it is interesting as another representative of a small natural family of trees found only in eastern Asia. A number of individuals of *Euptelea* are growing on the right-hand side of Azalea Path.

On the other side of this path are several individuals of another plant of the same family, *Eucommia ulmoides*. This is a hardy tree from central China to which a good deal of space has recently been given in the daily papers as the "Hardy Rubber-tree," and a possible source of rubber in countries with cold climates. *Eucommia* has not yet flowered in the Arboretum and the leaves are only just unfolding.

Some of the Plum-trees are now at their best and will soon be in full bloom. The first of the American species to flower, *Prunus nigra*, is a native of British America and through cultivation has become sparingly naturalized along the borders of the northeastern United States. This is a desirable ornamental tree as it produces in profusion every year its large flowers which in fading turn pink. The flowers of other American tree Plums will soon open. Among them are *Prunus americana* from the eastern United States, and *Prunus hortulana* and *Prunus Munsoniana* (the Wild Goose Plum) from the Mississippi valley. From these three species and from *Prunus nigra* most of the cultivated American Plums have been derived. Other American Plums now beginning to

show their flowers are *Prunus alleghaniensis*, a small tree from the mountains of Pennsylvania, and two shrubs from Kansas and Oklahoma, *Prunus Watsonii* and *Prunus orthosepala*. These are attractive when in flower, very hardy, and produce handsome fruits.

Among foreign Plums now in bloom the most interesting, perhaps, is *Prunus triflora*. This is a Chinese species not often seen in American gardens from which the so-called Japanese Plums largely grown by pomologists have been in part, at least, derived. The Plum collection will be found near the junction of the Forest Hills and Meadow Roads.

The group of Wild Pears (*Pyrus*) near the Forest Hills entrance and on the left-hand side of the Forest Hills Road is now interesting, for in this group are some of the handsomest of the early spring flowering trees. The Pears, of which there are a number of species, are natives of southern and western Europe, the Himalayas, of China and eastern Siberia. The genus has no American representative. The beauty of the flowers of several of the species from southwestern Europe is heightened by the silver color of the young leaves which generally unfold as the flowers open.

The first of the species in the Arboretum to flower is *Pyrus Simonii* from China. It has large and abundant flowers which now cover the leafless branches. The leaves of this tree, like those of several of the Chinese species, are large, thick and lustrous, and unlike those of any other Pear in the collection, turn in the autumn brilliant scarlet, a character which adds to the value of this species as a garden plant. Other plants just coming into flower are *Pyrus elaeagrifolia* and *Pyrus salicifolia* from the Caucasus, and these will soon be followed by a number of European species and by others from China. Among the latter the different forms of *Pyrus sinensis* are perhaps the most desirable in the whole group as they are very hardy and of rapid growth, and their flowers and leaves are large and abundant. The fruit, too, of some of these Chinese forms is juicy and edible. Another of the Chinese Pears, *Pyrus betulaeifolia*, has smaller flowers than the others but they are very abundant, but the small round fruits are not much larger than peas.

The Redbuds (*Cercis*) are just opening their flowers. The species of the eastern United States, *Cercis canadensis*, has been generally planted in the Arboretum and large plants can be seen from many of the roads. On the Meadow Road, nearly opposite the Plum group, is a tree of this species which produces white flowers. This variety was found a few years ago in the woods of southwestern Missouri and is still a rare plant in cultivation. *Cercis chinensis* has more beautiful flowers than the American species. Plants of this small eastern Asiatic shrub are now in flower on the left-hand side of Azalea Path.

Of several species of *Ribes* (Currants) now in flower in the Shrub collection the most interesting are two species from western North America. One of these, *Ribes cereum*, which is now covered with small white flowers, to be followed by sweet, edible, red fruits, is a native of the southern Rocky Mountain region where it is widely distributed. Unlike

many of the plants of that dry region, *Ribes cereum* has adapted itself to the climate of eastern New England. The other currant now of special interest is the yellow-flowered *Ribes aureum* from the northwestern part of the country. This is a tall shrub with slender, graceful stems and tubular bright yellow flowers and, although long cultivated in Europe, is still a rare plant in American gardens. It must not be confounded with another yellow-flowered species, *Ribes odoratum*, the so-called Missouri Currant, which is a native of the region about the headwaters of the Missouri River and a larger plant common in all old-fashioned American gardens.

The Shad Bushes (Amelanchier) mentioned in the last Bulletin are now in full flower and are remarkably fine this year.

No. 3

ARNOLD ARBORETUM

HARVARD UNIVERSITY

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HARVARD UNIVERSITY.

THE GIFT OF

Arnold Arboretum

MAY 16, 1911

JAMAICA PLAIN, MASS.

BULLETIN NO. 3.

The Chinese and Japanese Crabapples (*Malus*) are now in full bloom. There are two collections of these plants in the Arboretum. The oldest is on the left-hand side of Forest Hills Road; the other is at the eastern base of Peter's Hill. The plants in the second, or supplementary, collection are smaller than those in the first collection, but the Peter's Hill collection contains a larger number of species and varieties.

The best known of the eastern Asiatic Crabs is *Malus floribunda*. This is one of the handsomest and most satisfactory of all flowering trees for this climate. It blooms every year without fail, it grows to a large size in good soil and abundant space, and as it reaches maturity it assumes a picturesque habit. The bright pink flower-buds are very beautiful and the masses of small flowers which completely cover the branches are at first pink and then gradually become white. A seedling variety or hybrid of this tree which originated in the Arboretum has been called *Malus Arnoldiana*. This plant promises to remain a smaller tree than *Malus floribunda* but its long spreading and arching branches are very graceful and the flowers produced on long stems are more than twice as large as those of its parent. The flowers of this interesting tree are considered by some persons more beautiful than those of any other Crab-apple. Two Japanese species deserve attention; they are *Malus zumi*, a slender tree from the elevated region of central Japan, and *Malus Sargentii*, a low wide bush discovered a few years ago on the borders of a salt marsh in the northern island. The shrubby habit, unlike that of the other species of *Malus*, makes this an excellent plant for small gardens. The other Japanese species, *Malus toringo*, which grows also in northern China, is the last of the Asiatic species to flower and will not be in bloom for several days. Very beautiful now is the so-called Parkman Crab, *Malus Halliana*, with semi-double bright pink flowers hanging gracefully on long slender stems. This Chinese plant was introduced into the United States from Japan nearly fifty years ago by the late Gordon Dexter of Boston, and first flowered here in the gardens of Francis Parkman. Very beautiful, too, are *Malus spectabilis*, with pyramidal habit and semi-double flowers, and the variety or hybrid raised from it in Europe, *Malus Scheideckeri*. There are in the collection several plants with pure white flowers which are believed to be hybrids between *Malus prunifolia*, a tree which is unknown except in gardens, and the Manchurian *Malus baccata*. In brightness of color the red flowers of *Malus atrosanguinea* are not surpassed. This plant has the habit of *Malus floribunda* and is believed to be a hybrid from it. Several individuals of this will be found in the Peter's Hill collection.

Malus Niedzwetzkyana, from Russian Turkestan, is remarkable in the red color of the flowers, branches, leaves and fruit. This is probably only a variety of the common Apple, for among a number of seedlings raised at the Arboretum more have green than red leaves. The American Crabapples, with the exception of *Malus fusca*, from the northwest coast, and a hybrid of this species, *Malus Dawsoniana*, will not be in bloom for another week.

The Lilacs should be at their best by the end of the week. The earliest in the collection, the white-flowered *Syringa affinis*, is already in bloom. This slender shrub with fragrant flowers is a favorite ornament of the gardens of Peking. Nearly as early is another north China Lilac, *Syringa oblata*, with large pale purple, fragrant flowers. The broad, thick, leathery leaves of this shrub, unlike those of other Lilacs, turn deep bronze red in the autumn. Nearly as early to flower as these two Chinese species is *Syringa hyacinthiflora*, a hybrid between *Syringa oblata* and the Common Lilac. This hybrid grows to a large size, and the small, blue-purple double flowers are very fragrant. It is interesting as one of the early hybrids in this genus. More beautiful and in every way a more useful garden plant is another hybrid, *Syringa chinensis*, raised many years ago in France. The name is unfortunate for its parents are *Syringa vulgaris*, now known to be a native of the Balkan Peninsula, and Persian Lilac. The flowers of this hybrid are produced in long clusters which are so heavy that they become semi-pendant on the slender branches. There are varieties with rose-colored and with pale nearly white flowers. Another Chinese species, *Syringa pubescens*, will soon be in bloom. This has small leaves, and small, long-tubed pale purple flowers which are produced profusely in small clusters. The value of this plant is in the delicate perfume of the flowers. The collection of the Common Lilacs has been much enlarged and now contains nearly all the principal varieties, although some of the plants are still too small to flower.

Many of the Bush Honeysuckles (*Lonicera*) are coming into bloom. Large plants of some of the best of these will be found on the right-hand side of the Bussey Hill Road opposite the Lilacs; and in the Shrub Collection there is a large number of species, varieties and hybrids. All the varieties of the Tartarian Honeysuckle and many of the hybrids raised from it are hardy, desirable garden plants, with small, handsome flowers followed by showy fruits which ripen in early summer. One of the most interesting of the rare Honeysuckles now in bloom in the Arboretum is *Lonicera syringantha* var. *Wolfii* from western China with small clusters of purple fragrant flowers.

Many of the Currants and Gooseberries (*Ribes*) are now in bloom in the Shrub Collection and in the supplementary collection of these plants in the border opposite the Administration Building. Perhaps the handsomest of these in bloom this week is the white-flowered *Ribes niveum* from northwestern North America.

The Fothergillas are in bloom. These are plants from the southeastern United States of the Witch Hazel Family, and of the four species which are known three are established in the Arboretum. They all produce at the end of the branches as the leaves unfold small clusters of white flowers. A good plant of the largest of the species, *Fothergilla major*, may be seen in the Witch Hazel Group near the small pond at the junction of the Meadow and Bussey Hill Roads; and on Azalea Path are individuals of the other species.

On Azalea Path the red-flowered *Rhododendron* (*Azalea*) *Kaempferi* is opening its flowers. There are masses of this plant on both sides of the lower end of this Path and also between the Hemlocks and the Laurels at the northern base of Hemlock Hill. The shade and coolness of this last position suits this inhabitant of the high mountains of Japan, and it flowers here later than on Azalea Path and the flowers remain longer in good condition. When these flowers open in front of the dark background of Hemlocks, one of the most beautiful floral shows of the Arboretum season may be seen.

The Arboretum will be grateful for any publicity given these Bulletins.

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HARVARD UNIVERSITY

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HARVARD UNIVERSITY.

THE GIFT OF

Arnold Arboretum.

MAY 24, 1911

JAMAICA PLAIN, MASS.

BULLETIN NO. 4.

Of the seven Magnolias of the eastern United States five are established in the Arboretum. The others, *Magnolia grandiflora*, the great evergreen Magnolia of the south, and *Magnolia pyramidata* from the extreme southern part of Georgia and Florida, are not hardy at the north. Unlike the early flowering Magnolias of eastern Asia which bloom before the leaves appear, the American trees all flower after the unfolding of the leaves. The earliest in the Arboretum is *Magnolia Fraseri*, a rather small tree from the southern Appalachian mountains. The large, pale, cream-colored flowers of this hardy tree are now conspicuous at the ends of the slender branches. The next species to flower is *Magnolia cordata*, a small, round-headed tree with dark green leaves and small, cup-shaped bright canary yellow flowers. These now cover the trees, and during the summer a second crop of flowers is usually produced. The origin of this tree is obscure. It was sent more than a century ago from the United States to France by the French botanist Michaux. It has not been rediscovered, however, in the forests explored by Michaux, and is now known only as a cultivated tree. Several individuals have been growing for many years in the Harvard Botanic Garden and the plants in the Arboretum have been raised by grafts from the Cambridge trees. This tree does not produce seeds and therefore has remained extremely rare in collections. *Magnolia acuminata*, the Cucumber-tree, with small, yellow-green flowers, the largest of the Magnolias hardy at the north is just opening its flowers. *Magnolia tripetala*, the so-called umbrella tree, is also in bloom, and this will soon be followed by *Magnolia macrophylla*. These two trees have large leaves, and large fragrant, white flowers; and the flowers and leaves of the latter are larger than those of any other tree of the North Temperate Zone. Of the Magnolias hardy at the north none surpass in beauty of flowers and foliage *Magnolia glauca*, an inhabitant of swamps in the neighborhood of the coast from Massachusetts to Texas. This is a beautiful garden shrub or small tree and it should be much more often planted. It is the latest of the Magnolias to flower. The small, cream-white, cup-shaped, aromatic flowers which first open in June, continue to appear during several weeks, and the leaves, which are bright green and lustrous on the upper surface and silvery white below, remain on the branches until early winter at the north and until spring at the south. The American Magnolias are on the right of the Jamaica Plain entrance near the Administration Building.

Several of the Crabapples of the eastern United States are still in flower. They all have leaves more or less coated, at least while young, with a pale, felt-like covering of hairs, pink and very fragrant flowers, and fragrant, apple-like fruits hanging on long stems and covered with a sticky exudation. The principal species in the collection are *Malus coronaria* from the middle and southeastern states, *Malus ioensis* from the

Mississippi valley, and a double-flowered form of this known as the Bechtel Crab. This small tree was found a few years ago in one of the western states. It produces in great quantities double pink flowers which look like small clustered Roses and is certainly one of the most charming of all hardy flowering trees. There are large plants of these Crabapples at the foot of the wooded slope opposite the junction of the Forest Hills and Meadow Roads.

The Sheepberry or Nannyberry of northern woods and roadsides, *Viburnum Lentago*, is now conspicuous in many parts of the Arboretum. This is a large shrub or small round-headed tree with lustrous leaves and large flat clusters of pale cream-colored flowers, which in the autumn are followed by sweet dark blue fruits. Although one of the most beautiful and desirable of the shrubs of the northern United States, the Nannyberry is too seldom found in American parks and gardens. Equally beautiful and of rather more tree-like habit, *Viburnum prunifolium* of the middle states has now opened its flat clusters of white flowers. Plants of these Viburnums can be found on the right-hand side of the Bussey Hill Road where also the shrubby *Viburnum pubescens* is coming into flower. This is an American species with slender stems spreading into large clumps and small abundant clusters of white flowers.

On the left-hand side of the Bussey Hill Road, above the Lilacs, are two plants in flower of *Symplocos crataegoides*, a native of eastern Asia and one of the most beautiful flowering shrubs which Japan has contributed to our gardens. The small white flowers are produced in abundant clusters, but the great beauty of this plant is in the autumn when the branches are covered with small bright blue berries of a color not often seen in northern gardens. Evidently a plant which depends on favorable conditions of soil and climate, for it does not flourish in western Europe or even in western New York. *Symplocos crataegoides* is entirely at home in the Arboretum where it flowers and produces its fruits every year.

Not many of the small yellow-flowered shrubs from southern Europe, of the Pea Family, which are familiar and beautiful objects in European gardens, flourish in New England, but *Cytisus purgans* is now covered with flowers and seems quite at home in the Shrub Collection.

The most interesting plants, however, now in flower in the Shrub Collection will be found among the Honeysuckles (*Lonicera*). Of all the shrubs introduced by the Arboretum into New England none is now more generally cultivated or has proved more valuable than *Lonicera Morrowii*, a native of northern Japan. This in cultivation here is a broad high bush with wide-spreading lower branches clinging close to the ground. The pale blue-green foliage is pleasant in tone and the yellow flowers are produced in the greatest profusion. This remarkable shrub, which seems to grow here more vigorously than it does in Japan, has been largely planted in several of the Boston parks. Two charming plants now in bloom are *Lonicera amoena* and *Lonicera amoena Arnoldiana*, the latter a product of the Arboretum. They are garden hybrids of the Tartarian Honeysuckle and a species of central Asia, *Lonicera Korolkowii*, and are graceful shrubs with silvery gray foliage and slender,

pink flowers, and are of real value for the decoration of gardens. Other Honeysuckles now in bloom which should be noted are *Lonicera bella*, a large and vigorous hybrid of *Lonicera Morrowii* with the Tartarian Honeysuckle; *Lonicera minutiflora*, another hybrid, remarkable in the beauty of its brilliantly colored fruits; *Lonicera notha*, a hybrid of the Tartarian Honeysuckle with *Lonicera Ruprechtiana* of eastern Siberia; *Lonicera minutiflora* from central Asia; and another central Asia plant, *Lonicera coerulea graciliflora*, a slender, although vigorous, shrub with beautiful drooping flowers. These are only a few of the large collection of Bush Honeysuckles now in bloom.

Among the Diervillas, or, as they are often called, Weigelas, natives of the eastern United States and of eastern Asia, a genus in which many hybrids and varieties have been developed in Japanese and European gardens, the earliest to flower in the Arboretum are two Asiatic species which can be seen in the Shrub Collection. The more beautiful of these two species is *Diervilla florida*, a small shrub, with pale pink flowers, introduced into the Arnold Arboretum a few years ago by Mr. Jack, from Korea. This plant has probably played a considerable part in the production of some of the hybrid races, but as a garden plant the wild type is more desirable than any of its progeny. The other species, *Diervilla praecox*, has larger flowers of a rather disagreeable purple tone. It is believed to be a native of Japan.

On the curve of the Meadow Road beyond the Administration Building several plants of the pink-flowered *Rhododendron* (*Azalea*) *canescens*, the *Azalea nudiflora*, in part, of the old botanists, are coming into bloom. Plants of this beautiful native shrub can also be seen on Azalea Path.

An illustrated guide to the Arboretum containing a map showing the position of the different groups of plants has recently been published. It will be found useful to persons unfamiliar with the position of the different groups of plants. Copies of this guide can be obtained at the Administration Building in the Arboretum, from the Secretary of the Massachusetts Horticultural Society, 300 Massachusetts Avenue, Boston, from The Houghton, Mifflin Company, 4 Park Street, Boston, and at the Old Corner Bookstore, Bromfield Street, Boston.

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MAY 31, 1911

JAMAICA PLAIN, MASS.

BULLETIN NO. 5.

Three Maples now in bloom are valuable as flowering plants. The first, *Acer tataricum*, a small tree of eastern Europe and western Asia, although rarely seen in American collections, is an old inhabitant of gardens. The flowers are white and are produced in erect clusters longer than broad. More conspicuous even than the flowers are the scarlet wings of the fruit which are brightly colored in summer and remain a long time on the branches. The second of these Maples, *Acer ginnala*, is a small shrubby tree of eastern Siberia where it is abundant in the valley of the Amoor and in the neighborhood of Vladivostock. The flowers are pale yellow and, unlike those of most Maples, are very fragrant. The great value of this plant, however, is in the color of its autumn foliage. The leaves drop early but before withering assume tints of scarlet which are not surpassed in brilliancy by the dying foliage of any American tree. These Maples can be found in the Maple Group near the north end of the Shrub Collection. As a flowering plant *Acer spicatum* deserves attention. This shrub, or small tree, of our northern forests is now covered with its long erect racemes of yellow flowers which do not open until the yellow-green lobed leaves are fully grown. There are several plants of this beautiful Maple near the first of the ponds on the right-hand side of the Meadow Road, and in other parts of the Arboretum.

Among the Hawthorns which are planted between the Shrub Collection and the Parkway bordering the Arboretum are a few interesting trees still in flower. Of American species the handsomest is now *Crataegus nitida* with wide-spreading branches arranged in flat open layers and lustrous foliage. This belongs to a southern group of these trees which bear small flowers in crowded clusters and small red fruit. Another handsome species is *Crataegus secunda*. This is a round-topped tree with long lower branches spreading over the ground and large flowers followed by oblong dull red fruit. These two trees, first cultivated in the Arboretum, were raised from seeds gathered thirty years ago in the neighborhood of St. Louis. *Crataegus aprica* from the foothills of the southern Appalachian Mountains is also in flower. This is a small-leaved tree with large flowers in few-flowered clusters and large, dull, orange-red fruits. It is interesting as the only representative of a large natural group confined to the southeastern United States which has flowered in the Arboretum. Beyond the American species, and between them and the Willow plantation, are several foreign species of *Crataegus*. The handsomest of these now in bloom is *Crataegus pinnatifida*, with large, lustrous deeply-divided leaves and large flowers in many-flowered clusters. There are large orchards of this tree in the neighborhood of Peking where it is cultivated for its oblong, scarlet and lustrous fruits.

In the third of these bulletins attention was called to *Lonicera syringantha* var. *Wolfii* from western China. Next to this plant in the Shrub Collection *Lonicera syringantha* itself is now in bloom. It is a taller shrub than the variety with more gracefully disposed branches and pale pink or nearly white very fragrant flowers, and in this climate is a garden plant of real value. The pure white flowers of *Lonicera Maackii* from the valley of the Amoor River in eastern Siberia are larger than those of any other Bush Honeysuckle in the Arboretum, and their beauty is increased by the dark green leaves of this hardy plant. The fruit, however, is

small and uninteresting. Next to it in the Shrub Collection there is a specimen of the form of this species from western China, the var. *podocarpa*, which is in every way a less desirable garden plant.

In the fourth of these bulletins attention was called to *Diervilla praecox*, a native of Japan. Some of the hybrids of this plant raised in France are now flowering in the Shrub Collection. Hardier than some of the other garden races of *Diervilla*, these are valuable for the spring gardens. The handsomest variety in the collection is perhaps the one called *Le Printemps*; other varieties now in flower are *Gracieux* and *Conquérant*.

The *Deutzias* are generally not very satisfactory garden plants in this climate, and several of the species and varieties suffer here from the cold of severe winters. The exception is a hybrid between the Japanese *Deutzia gracilis* and *Deutzia parviflora* from northern China, called *Deutzia Lemoinei* for the great French hybridizer by whom it was produced a few years ago. This plant resembles *Deutzia gracilis*, but it grows into a taller and broader shrub, and the flowers are larger. It is certainly one of the best garden plants of recent introduction. With the other species, varieties and hybrids which are grown here it can be seen in full flower in the Shrub Collection. The number of Chinese species of *Deutzia* is now known, largely through the investigations of the Arboretum, to be thirty-two, although twenty-five years ago only five Chinese species had been described. Many of these new species are now growing in the Arboretum nurseries, but it is too soon to speak of their value as garden plants.

Spiraea Van Houtii is a hybrid raised in Europe between *Spiraea cantoniensis*, a rather tender Chinese species, and *Spiraea trilobata* of Siberia. It is easily propagated and grows rapidly into a tall broad shrub, and has been largely advertised and distributed in recent years. It suffers, however, in cold winters and is less valuable than *Spiraea trilobata*, which is a dwarfier plant with spreading and pendant branches, and is perfectly hardy and as free flowering as its offspring. Although first brought to this country at least eighty years ago, *Spiraea trilobata* is now rarely found in American gardens. These two *Spiraeas* can now be compared in the Shrub Collection where they are in flower side by side, and where there are many other species of this genus.

Enkianthus is an eastern Asiatic and Himalayan genus, with drooping clusters of small, bell-shaped flowers, and dry capsular fruits, and is related to *Andromeda*. Three Japanese species are well established in the Arboretum and can be seen in the Shrub Collection and in a large group on the right-hand side of Azalea Path. The handsomest of the three species, *Enkianthus campanulatus*, is a tall shrub with slender erect stems and branches, and light yellow or rose-colored flowers. It is found in every Japanese garden where it is valued for the bright scarlet color the leaves assume in autumn, and where it is often cut into balls and other fantastic shapes. This *Enkianthus* is a garden plant here of real value. The other species, *Enkianthus japonicus* and *Enkianthus subsessilis*, are smaller plants with smaller yellow flowers and are less valuable ornaments of the garden.

Roses are already beginning to flower. The earliest in the Shrub Collection is *Rosa cinnamomea*, the old-fashioned Cinnamon Rose. A more beautiful plant now in flower in the Shrub Collection is a Siberian form of the so-called Scotch Rose known as *Rosa spinosissima* var. *altaica*.

This is a very hardy plant which grows here into a tall wide bush and every spring covers itself with numerous large single white flowers faintly tinged with yellow. Of the single-flowered Roses which are hardy in New England this is one of the most valuable.

Of the early flowering Rhododendrons in the collection at the eastern base of Hemlock Hill the most interesting is now *Rhododendron Smirnowii*, a native of the Caucasus. This is a shrub with pale, gray-green leaves clothed below with a thick, felt-like rusty brown covering and light pink flowers in large clusters. It is very hardy but the leaves suffer from the summer sun, and half-shaded positions are favorable to its greatest beauty. Hybrids of this species with forms of *Rhododendron catawbiense* promise to be valuable garden plants.

Vaccinium corymbosum, the High-bush Blueberry of New England swamps, has been largely planted in different parts of the Arboretum and is now covered with its white bell-shaped flowers. This is one of the most beautiful shrubs of eastern North America. The habit is good; the flowers and fruit are beautiful, and no other plant has a more splendid autumn color. The High-bush Blueberry, however, is rarely cultivated. Attention, however, has been recently called to it by a Bulletin of the Department of Agriculture in which the results of Dr. Coville's experiments in propagating and cultivating this plant are published.

Of the Viburnums with palmately lobed and veined leaves, and a ring of showy sterile flowers surrounding the flower-clusters, three species are cultivated in the Arboretum, *Viburnum Opulus* of northern and central Europe, *Viburnum Sargentii* of northeastern Asia, and *Viburnum americanum* of northeastern North America. The first is the largest plant of the three, with larger and thicker leaves late-persistent in the autumn, and dark red fruit. The old-fashioned Snowball of gardens is a form of this species with all the flowers sterile, and there is a very dwarf form which rarely flowers. The flowers of *Viburnum Sargentii* are more showy than those of the other species, but the fruit is small and inconspicuous. The habit of *Viburnum americanum*, the so-called High-bush Cranberry, is less compact than that of the other species. The flowers, however, are beautiful, and the fruit, which is translucent and very lustrous, remains on the branches through the winter; in the autumn the leaves turn bright orange-red before falling. The three species are all very hardy. *Viburnum americanum* and *Viburnum Sargentii* have been generally planted in the Arboretum, and very large plants of *Viburnum Opulus* can be seen on the Parkway and in some of the other Boston parks.

An illustrated guide to the Arboretum containing a map showing the position of the different groups of plants has recently been published. It will be found useful to persons unfamiliar with the position of the different groups of plants. Copies of this guide can be obtained at the Administration Building in the Arboretum, from the Secretary of the Massachusetts Horticultural Society, 300 Massachusetts Avenue, Boston, from The Houghton, Mifflin Company, 4 Park Street, Boston, and at the Old Corner Bookstore, Bromfield Street, Boston.

The Arboretum will be grateful for any publicity given these Bulletins.

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Gray Herbarium
Harvard University

No. 6

ARNOLD ARBORETUM

HARVARD UNIVERSITY

BULLETIN

OF

POPULAR INFORMATION



JAMAICA PLAIN, MASS.

JUNE 6, 1911

BULLETIN NO. 6.

Many of the *Rhododendrons* in the collection at the base of Hemlock Hill are now in flower and can be most easily reached from the South Street entrance. Owing to the heat and drought of May the flowers are smaller than in more favorable seasons and they will probably not last long in good condition.

The variety of these plants which can be successfully grown in this climate is not large, and they are mostly derived from a few species. The most important of these species are three *Rhododendrons* of the eastern United States—*Rhododendron catawbiense*, *Rhododendron punctatum* and *Rhododendron maximum*. The first grows only on the high summits of the southern Alleghany Mountains where it sometimes covers enormous areas, but is rarely found much below an altitude of five thousand feet. This plant is very hardy and in cultivation forms a broad, low bush; it grows slowly, however, and the flowers are of a rather disagreeable purplish rose color. It is most interesting for the part which it has played in the production of the principal race of garden *Rhododendrons*. Several plants are now in flower along the drive not far from the South Street entrance. The second species, *Rhododendron punctatum*, is also a native of the southern Appalachian region where it grows at much lower altitudes than *Rhododendron catawbiense*. It forms a dense low bush with small leaves thickly covered on their lower surface with dark dots, and small, reddish purple flowers in small compact clusters which are a good deal hidden by the young branches which, growing before the flowers open, overtop them. This plant, of which there are good specimens in the collection, will not be in bloom for several days. There are two hybrids of this species known in gardens as *Rhododendron Wilsoni* or *arbutifolium*, and *Rhododendron myrtifolium*. The former is a cross with the alpine *Rhododendron ferrugineum* and the latter with the alpine *Rhododendron hirsutum*. In habits and foliage they are handsomer plants than their American parent, and are useful for small gardens and for the margins of beds of larger plants; they will not be in bloom for several days. *Rhododendron maximum*, the third of the American species, is found occasionally in New England swamps and is very common along the borders of streams in mountain valleys south of New York, often growing to the size of a small tree and sometimes forming impenetrable thickets of large extent. This is the latest of the *Rhododendrons* to flower here and will not be in bloom for several weeks. The flowers and the flower-clusters are much smaller than those of *Rhododendron catawbiense* and, like those of *Rhododendron punctatum*, they are hidden by the branchlets of the year which surround and rise above them. A hybrid of *Rhododendron maximum* and *Rhododendron catawbiense*, raised in England and known as *Rhododendron delicatissimum*, is in this climate one of the most beautiful and desirable of garden *Rhododendrons*. It has white flowers tinged with pink, which appear after those of most of the other *catawbiense* hybrids have passed. Another English hybrid of the same parentage, *Rhododendron Wellesleyanum*, is less hardy here than either of its parents; and among a large number of seedling plants of *Rhododendron maximum* crossed with some of the red-flowered *catawbiense* hybrids, raised near Boston, only a few have been able to bear the cold of the New England winters. Other species in the collection are the

European *Rhododendron ferrugineum* and *Rhododendron hirsutum*, the Japanese *Rhododendron brachycarpum* and *Rhododendron Metternichii*, the first with yellow and the other with rose-colored flowers. Several plants of a hybrid of this last crossed with garden hybrids of *Rhododendron catawbiense* have proved hardy in the Arboretum and promise to be valuable additions in the collection. *Rhododendron ponticum* of southern Europe and Asia Minor is hardy only in sheltered positions and is not a desirable plant for this climate. In England it is the common *Rhododendron* of parks and game preserves. *Rhododendron caucasicum* is an early-flowering species from the Caucasus, with compact clusters of yellowish white flowers. There are several hybrids and varieties of this handsome plant in cultivation which have proved hardy in the Arboretum and deserve to be better known here than they are at present. The flowers of many of these have already faded, but a plant called *coriaceum* at the front of the group, just beyond the turn from the Valley Road into Hemlock Hill Road, gives a good idea of the plants of this parentage.

The large plants in the collection are all hybrids of *Rhododendron catawbiense* and it is these hybrids which are generally planted in American gardens. They are of different parentage and have been obtained by crossing *Rhododendron catawbiense* with *Rhododendron maximum*, *Rhododendron ponticum*, and with *Rhododendron arboreum*, and other species with highly colored flowers from the Himalayas. A large number of these hybrids are cultivated in Europe, but only a few of them in which the blood of *Rhododendron catawbiense* predominates are really hardy in New England.

The Arboretum is often asked for a list of the varieties which can be grown here. The following which can be seen in the collection either as large or small plants have been the most successful in the neighborhood of Boston: *album elegans*, *album grandiflorum*, *atrosanguineum*, *bicolor*, *Charles Bagley*, *Charles Dickens*, *delicatissimum*, *Edward S. Rand*, *Everestianum*, *F. L. Ames*, *H. W. Sargent*, *Hannibal*, *Kettledrum*, *King of the Purples*, *Henrietta Sargent*, *Lady Armstrong*, *Mrs. Millner*, *Mrs. Charles Sargent*, *Mrs. Harry Ingersoll*, *purpureum elegans*, *purpureum grandiflorum*, *roseum elegans*, *Sefton*.

Like most plants of the Heath Family to which the *Rhododendrons* belong, it is impossible to cultivate them in soil impregnated with lime. The area in the eastern states, therefore, where they can be successfully grown is comparatively small.

The Laurels (*Kalmia latifolia*) will be in bloom before the end of another week. They are planted beyond the *Rhododendrons* at the northern base of Hemlock Hill and furnish the last and one of the most beautiful of the yearly flower shows of the Arboretum.

The Inkberry (*Ilex glabra*), which is planted in a large group on the right-hand side of Hemlock Hill Road and opposite the Laurels, will soon be in bloom. The flowers, like those of all Hollies, are small and are arranged in small clusters in the axils of the leaves, and the small, black fruit, which does not fall until spring, makes but little show. The value of this plant is not in its flowers or fruits but in its compact habit and its shining persistent leaves which make it one of the very best of the broad-leaved evergreen shrubs which can be grown in this climate. The Inkberry is common in sandy soil and in the neighborhood of the coast from Massachusetts to Louisiana. It is very hardy and is not planted as often as it should be when hardy evergreens are needed. An-

other black-fruited evergreen Holly, *Ilex crenata*, a native of Japan, is more often found in gardens. This is an upright growing plant sometimes becoming a small tree, and varies considerably in the size of its leaves. It is hardy only in favorable positions, and during the last winter the plants with broad leaves suffered severely while the narrow-leaved plants were uninjured. This is interesting because the two forms were raised from seeds collected in one locality in Japan. A number of plants of *Ilex crenata* can be seen on Azalea Path.

Large plants of the Golden Chain, *Laburnum vulgare*, are occasionally seen in the neighborhood of Boston where this handsome European tree has long been planted. It is not very hardy, however, and succeeds only in sheltered positions. A better plant for this region is the so-called Scotch Laburnum, *Laburnum alpinum* of the mountain region of central Europe. This is a large shrub or small tree blooming about two weeks later than *Laburnum vulgare*, and the bright yellow flowers are produced in longer clusters than those of the other species. It grows rapidly and is perfectly hardy. A large plant now in full bloom can be seen close to the Shrub Collection on the Forest Hills Road. This is perhaps the most desirable yellow-flowered shrub or small tree which is hardy in this climate, and it is unfortunate that a plant of this character, which is so generally cultivated in Europe, should be so little known in American collections.

The largest, one of the handsomest and hardiest of the Diervillas, *Diervilla japonica*, a native of the elevated regions of central and northern Japan, is now in flower in the Shrub Collection. It forms a bush ten or twelve feet high and wide, with stout arching stems, and flowers which are rose color, pale yellow, dark red or nearly white on the same branch or on different branches of the same individual, the light-colored flowers often becoming rose color in fading. This is another plant which is too little known in American gardens.

Rosa Arnoldiana is in flower in the Shrub collection. This is a hybrid between *Rosa rugosa* and *General Jacqueminot*, one of the red-flowered Hybrid Perpetual Roses, and was raised several years ago at the Arboretum by Mr. Dawson. It bears some resemblance to an English Rose known as *Carmine Pillar*. It is a much hardier plant, however, with handsomer foliage, and the equally large flowers are of even a deeper crimson color. The flowers which are produced in clusters open in succession and when cut last a long time in good condition. This plant is of special interest to the students of Roses who are trying to produce a better race than now exists for our northern gardens, for it furnishes another proof of the value of *Rosa rugosa* as an element in such a race.

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JAMAICA PLAIN, MASS.

JUNE 14, 1911

BULLETIN NO. 7.

The flowers of *Syringa villosa* are just falling. This inhabitant of northern China is in cultivation here a large and shapely shrub with good foliage and pale pink or nearly white flowers in large, compact, erect clusters which are produced in great profusion. The odor of the flowers is disagreeable. The Hungarian Lilac, *Syringa Josikaea*, is still in flower. This is a tall shrub with loose, unattractive habit, small leaves, and long, slender, open clusters of small, purple flowers. This is perhaps the least attractive of all the Lilacs. The crossing, however, of these two species has given rise to a race of Lilacs which prolongs the season of flowering of the true Lilacs for nearly two weeks. This new race is called *Syringa Henryi* in honor of Monsieur L. Henry, at one time gardener at the Jardin des Plantes in Paris, who made these hybrids. The best known of them is Lutèce, so-called because it originated in Paris. This is a compact, fast-growing, large shrub with foliage resembling that of *Syringa villosa* and large clusters of rose-purple flowers, and is one of the handsome and desirable shrubs of recent introduction.

There is a group of Lilacs which bloom even later than this hybrid. They are not true Lilacs, however, belonging to the section Ligustrina of the genus which differs from the true Lilacs in the short tube of the corolla from which the stamens protrude. There are three species of this group, all natives of northeastern Asia. They are shrubs or sometimes trees, and they all produce white, bad-smelling flowers in large clusters. They are just coming into bloom in the Lilac Group on the left-hand side of the Bussey Hill Road. The first to flower, *Syringa amurensis*, is a native of eastern Siberia, as its name indicates. It is a small tree, with flat, spreading or slightly drooping clusters of white flowers. The second species to flower, *Syringa pekinensis*, a native of northern China, is a shrub rather than a tree, although it sometimes reaches the height of thirty feet, with numerous stout stems more or less pendant at the ends and covered with bark peeling off in thin layers like that of some Birch tree. The long, narrow leaves hang gracefully and the half-drooping flower-clusters, which are flat and unsymmetrical, are smaller than those of the other species but are produced in great quantities. *Syringa japonica*, a native of the forests of northern Japan, is the last of the Tree Lilacs to flower and is really a tree often thirty or forty feet high, with a tall, stout trunk covered with lustrous bark like that of a Cherry tree, and a round-topped head. The leaves are large, thick and dark green, and the flowers are produced in large, erect, symmetrical clusters. Like the other species of this group, *Syringa japonica* loses its leaves early in the autumn without change of color. *Syringa amurensis* and *Syringa pekinensis* have not become common in gardens, but *Syringa japonica* has been quite generally planted in those of the eastern states. It is of interest that this remarkable tree was first sent to America and thence to Europe by a citizen of Massachusetts, the late William S. Clark, the first President of the Massachusetts Agricultural College and later the first President of the Agricultural College at Sapporo in Japan. In December, 1876, a small collection of seeds gathered in the neighborhood of Sapporo were received at the Arboretum from Colonel Clark and among them were seeds of this Lilac. The seedlings raised from this seed and their descendants are the native plants now cultivated in the United States and Europe. One of the original seedlings can be seen in the Apple Group on the right-hand side of the Forest Hills Road, the site

of the first Arboretum Nursery in which this Lilac was planted. The United States and Europe owe to Colonel Clark the introduction of some other good plants. Among the seeds sent by him to the Arboretum were those of *Cercidiphyllum* (see Bulletin No. 1), the climbing *Hydrangea* (*Hydrangea petiolaris*), *Phellodendron sachalinense*, and the northern broad-leaved form of *Evonymus radicans*, the variety *vegetus*.

It is too soon to speak of two species of *Phellodendron* found by Mr. Wilson in China, but of the three species established in the Arboretum *Phellodendron sachalinense* is the handsomest. All the species are natives of eastern Asia, and are small trees with pinnate leaves, small clusters of inconspicuous yellow flowers, the male and female flowers being produced on different individuals, and black, berry-like fruits; they have bright yellow wood and roots, and all parts of these trees are permeated with a fragrant aromatic oil which apparently makes them immune from the attacks of insects. *Phellodendron sachalinense*, which is a native of Saghalin and the northern island of Japan, has grown in the Arboretum into a tree about thirty feet high, with a tall, straight trunk, and wide-spreading branches forming a shapely flat-topped head. The seedlings springing up naturally near the old trees indicate that it is likely to hold its own in New England. The hardiness of this tree, its rapid growth, and the fact that it is not injured by insects, suggest that this is a good subject to plant in narrow streets. Seeds will be sent from the Arboretum in the autumn to anyone who may desire to grow this tree. A specimen of the male tree now in flower can be seen on the left-hand side of the Meadow Road, and in the group of these trees on the right-hand side of the road there is a female tree with the fruit just forming. In this group male trees of the type of this genus, *Phellodendron amurense*, from eastern Siberia are in bloom. These show already the thick, pale, cork-like bark to which this genus owes its name.

Just beyond the *Phellodendron* Group the *Evonymus* Group can be found. In this group several plants of the *Evonymus* introduced by Colonel Clark, *Evonymus radicans vegetus*, naturally a vine, are grown as low broad bushes. This is the hardiest of the many forms of this evergreen *Evonymus*. The leaves are broader and handsomer than those of the other forms, and the fruit is produced on young plants in great abundance. The plants, which are now in flower, can be compared in this group with the forms of this plant which are more usually cultivated in this country. Some of the deciduous-leaved species of *Evonymus* are also in flower here, and although they are more conspicuous in the autumn when the leaves often turn to bright colors and the brilliant fruits cover the branches, they are always interesting, and worth examination this week.

Opposite the *Evonymus* Group the Smoke-tree (*Cotinus*) of old-fashioned gardens is in bloom. The flowers are not conspicuous, and it is the clusters of the lengthening hairy colored stems of the flowers which make the "smoke" and the conspicuous feature of this plant which is a native of southern and southeastern Europe, the Himalayas and western China. Near it is a large plant of the American *Cotinus* which is also in flower. The clusters of hairy flower-stems are less conspicuous than those of its Old World relative, but the foliage is larger, lighter-colored, and in autumn turns brilliantly to orange and scarlet shades. This plant serves as an illustration of the fact that it is impossible to predict the hardiness of any plant from the character of the climate where it grows naturally. The American Smoke-tree, a native of the south where it

is found only in regions of comparatively mild winters, is perfectly hardy in New England in the most exposed positions, while native plants and others from much colder regions have suffered severely during the past winter. The American Smoke-tree is as much at home in western Europe as it is in New England, although usually the trees and shrubs of the southeastern United States do not flourish in Great Britain where they miss the summer and autumn heat necessary to properly ripen their wood.

The Mock Oranges (*Philadelphus*) are fast coming into bloom, and several of them will be in flower during the present week. They can be found in the Shrub Collection and in the large supplementary collection on the right-hand side of Bussey Hill Road opposite the Lilacs. Those which deserve particular attention now are *Philadelphus inodorus*, a native of the southern Appalachian region, with large solitary pure white flowers, and, although still little known one of the most distinct and beautiful of the genus; *Philadelphus Falconeri* of unknown origin, but probably a native of China and Japan, as it was sent to the Arboretum many years ago from the Parsons Nursery on Long Island where many eastern Asiatic plants were first cultivated in this country; *Philadelphus maximus*, a hybrid between two American species and the largest of all the Mock Oranges. In old gardens near Boston this plant has sometimes grown to the height of thirty feet. *Philadelphus Lemoinei* is also in flower. This is the result of a cross between the common Mock Orange of gardens, the European *Philadelphus coronarius*, and the small-flowered and small-leaved *Philadelphus microphyllus* of the Rocky Mountains of Colorado. This cross was made by Lemoine of Nancy, the most successful of hybridizers, who had received the Colorado plant from the Arboretum, and it was the beginning of a race of dwarf garden shrubs produced by Lemoine which have few equals in beauty. *Philadelphus microphyllus* itself will not expand its fragrant flowers for several days, but many of its progeny are now beginning to flower. Some of the most interesting of these are the varieties known as Avalanche, Boule d'Argent, Boquet Blanc, Candélabre, Conquête, Fantasia, Gerbe de Neige, Manteau d'Hermine, Mont Blanc, Nuée Blanche, Pavillon Blanc, and several others.

The last of all the Hawthorns to bloom is just opening its buds. This is the so-called Washington Thorn, *Crataegus cordata*, a native of the southern Appalachian foothills and the region westward to Missouri. It is a tree sometimes thirty feet high with erect branches, small, nearly triangular, shining leaves which turn bright scarlet in the autumn, small, dull white flowers in small compact clusters, and small scarlet fruit which remains on the branches with little less color until spring. The late flowers, the brilliancy of the autumn foliage and the abundance and brightness of the fruit during the winter months make this one of the most desirable of the American Hawthorns as a garden plant. The leaves are not destroyed by the leaf-mining caterpillars which make the foliage of many American Hawthorns look in early summer as if they had been scorched by fire; its only drawback is the brittleness of the branches which are sometimes broken down by the weight of snow. Several large plants of the Washington Thorn can be seen on the slopes of the overlook near the top of Bussey Hill.

The flowers of the Laurel (*Kalmia*) are at their best and should be seen this week. They can be most easily reached from the South Street and and from the Walter Street entrances.

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No. 8

ARNOLD ARBORETUM

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JAMAICA PLAIN, MASS.

JUNE 20, 1911

BULLETIN NO. 8.

The Western, or, as it is sometimes called, the Hardy Catalpa, *Catalpa speciosa*, is in flower this week. The true characters of this tree were overlooked by botanists until about thirty years ago when the remarkable durability of its wood first called much attention to it. It is a native of the valley of the Mississippi where on the rich, moist and often inundated bottom-lands of streams it sometimes attains the height of one hundred feet. It differs from the other American species, *Catalpa bignonioides*, which will not be in flower for two or three weeks, by the longer points of the leaves, by the larger flowers only slightly spotted on the inner side of the corolla and borne in short open few-flowered clusters, and by the stouter pods. It is a much hardier tree than the more southern species and has a more erect habit, and it grows more rapidly; indeed it often grows too rapidly and then sometimes suffers in cold winters from splits in the trunk. At one time much was expected of this tree and the agricultural and horticultural journals were filled with descriptions of its many virtues. All the Catalpas have only a thin layer of sapwood, and the whole trunk is therefore almost entirely composed of heartwood; this resists decay for a long time, and there are well authenticated records of Catalpa fence-posts having remained in the ground for half a century without deterioration. For the production of fence-posts, telegraph and other poles, no other tree gives a better yield if it is planted in rich soil. Catalpa wood is very soft, and the claims that this tree would supply the railroads with the best possible ties have not been fulfilled for the wood is too soft to resist the cutting of the rails. If as a timber tree the Western Catalpa is less valuable than was at one time supposed, it is the handsomest of all the Catalpas which have flowered in the United States and a fast-growing, desirable, ornamental tree. *Catalpa ovata* (sometimes called *Catalpa Kaempferi*), a native of central and western China, although first brought to this country from Japan where it has been cultivated for more than two centuries, is not yet in flower. This is a small tree which in July produces in great profusion its small light yellow flowers which are succeeded by slender pods. It is hardier than either of the American species but very inferior to them as an ornamental tree. A hybrid of this tree and one of the American species, *Catalpa Teasii*, is a valuable ornamental tree. It appeared several years in the nursery of J. C. Teas in Indiana, and is a perfectly hardy and fast-growing tree with larger leaves than either of its parents and enormous flower-clusters containing from two hundred to three hundred flowers. The corolla is slightly tinged with yellow and is marked by broad purple stripes. This hybrid will not be in flower until next month. *Catalpa Bungei* is established in the Arboretum where it appears perfectly hardy. This small tree is a native of northern China where it is often planted in temple gardens and was introduced by the Arboretum into the United States and Europe a few years ago. It has very dark green leaves and small yellow flowers in small clusters and, although it has not yet flowered here or in Europe, it will probably be of slight value as an ornamental tree. There is another plant usually called *Catalpa Bungei*. This is a dwarf, round-headed bush which is often planted in formal gardens where it is frequently seen grafted on the tall naked stems of one of the tree species. This dwarf, which never flowers, is really a form of *Catalpa bignonioides* and how it got the name of *Catalpa Bungei* is a mystery which will probably never be cleared up.

The right name is *Catalpa bignonioides*, var. *nana*, but nurserymen will probably continue to sell it as *Catalpa Bungei*. Two Chinese *Catalpas* raised from seeds collected by Mr. Wilson in the eastern part of the empire have passed successfully through the winter but it is too soon to speak of their value. The *Catalpas* are planted in a large group on the eastern slope of Bussey Hill between the Ashes and the Elms, and above the bank occupied by the Lilac Collection.

The flowering time of the Mock Oranges (*Philadelphus*) is at its height. The flowers of a few of the species have already fallen and the buds of others are still to open, but a large number of the species and hybrids are now at their best and the collection should be seen by all who are interested in handsome flowering shrubs. Attention is called to *Philadelphus grandiflorus*, *Philadelphus floridus*, and *Philadelphus latifolius* from the southern Appalachian region. Of the Asiatic species now in flower the most interesting is perhaps *Philadelphus pekinensis*. This forms a low, broad compact bush which is covered with small flowers faintly tinged with yellow. Of more open habit and later to flower is *Philadelphus sericanthus* from western China. There are good specimens of this new plant in the collection on the right-hand side of Bussey Hill Road which are just opening their pure white slightly fragrant flowers. The innumerable flower-buds of *Philadelphus microphyllus* are slowly opening. Less showy than most of the other species, not one surpasses this Rocky Mountain plant in delicacy and in the fragrance of its small flowers, and on the whole the American species and their hybrids of this genus are more beautiful garden plants than the Asiatic species which have up to this time been introduced into the Arboretum.

Ligustrum ibota is in flower. This Japanese and Chinese plant was sent to the Arboretum in 1878, and is now often seen in parks and gardens where it has been much planted in recent years. It is a broad shrub sometimes ten feet high, with spreading slightly recurved branches, small dark green leaves which turn purplish in the autumn, and short nodding clusters of white flowers which are produced in great quantities on short lateral branchlets, and which are followed by clusters of small, purplish black fruit often persistent on the branches until spring. This is one of the handsome species of the genus. Equally handsome but of very different habit is its variety *Regelianum*. This is a much lower and denser shrub with horizontally spreading branches which form a broad, flat-topped head and larger leaves. As the two plants grow side by side in the Shrub Collection they appear very distinct, but seedlings of the variety are often identical with *Ligustrum ibota*. The common Privet of western Europe and several of its varieties are also in flower in the Shrub Collection.

Among the *Potentillas* in the Shrub Collection are two excellent plants for small gardens, as they do not grow to a large size and continue to flower for a long time. The first of these, *Potentilla davurica*, is a native of eastern Siberia and is covered with white flowers which look like miniature Roses; and the other, *Potentilla Friedrichsenii*, is a hybrid between *Potentilla davurica* and the well known *Potentilla fruticosa*. This hybrid is a handsomer plant than *Potentilla fruticosa* which it resembles in habit, with rather lighter yellow flowers and is one of the good introductions of recent years.

Two, at least, of the Old World Buckthorns (*Rhamnus*) seem destined to become naturalized in this part of the world. *Rhamnus catharticus*, the

best known species of the genus, already grows spontaneously in some of the eastern states, and seedlings of *Rhamnus Frangula* spring up so frequently in the Arboretum and grow so rapidly and vigorously that it is evidently entirely at home here. *Rhamnus catharticus* was probably much oftener planted in the United States a hundred years ago than it is now. New introductions have caused its value to be forgotten. This is unfortunate for this Buckthorn is a valuable shrub for our climate where it sometimes becomes a small tree at least thirty feet high. The flowers, like those of all Buckthorns, are inconspicuous but the leaves are bright and shining and remain on the branches after those of most shrubs have fallen, contrasting beautifully in the autumn with the black, shining fruits which make a fine display until late in the winter. This Buckthorn is one of the best hedge plants in this climate. *Rhamnus catharticus* is already out of flower and the fruit is formed, but *Rhamnus Frangula* is flowering and will continue to flower for a long time as the flowers open in succession so that green, red and black fruits appear together on the same branch, these being the colors the fruit assumes as it grows and ripens. *Rhamnus Frangula* is a tall shrub with slender erect stems and branches and very lustrous leaves which, like those of the other species of the group, fall in the autumn without change of color. The Buckthorn Group is on the left-hand side of the Meadow Road where these species can be seen. *Rhamnus Frangula* is planted, too, in other parts of the Arboretum, and it can often be seen in the shrubberies of the Boston parks.

On the cover of the June 15th issue of *Country Life in America* a water-color drawing of the Sargent Rose by Mr. George Walter Dawson of the University of Pennsylvania is reproduced. The Sargent Rose was raised at the Arboretum in 1903 and is the result of a cross between the Hybrid Perpetual Rose and a hybrid, Baroness Rothschild, made at the Arboretum by Mr. Dawson between *Rosa Wichuraiana* and the Crimson Rambler. The flowers are cup-shaped, pale clear pink and semi-double, that is there are two rows of petals, and they are produced in large clusters, each composed of from fifty to sixty flowers. The flowers open gradually and in succession, so that the plant is covered with flowers for several weeks. The Sargent Rose is one of the handsomest Roses that has been raised in the United States. The original plant, which is now about eight feet high and eight or nine feet through, is now in flower and can be seen in the nursery at Mr. Dawson's house on Centre Street near the Centre Street entrance. This nursery can also be reached by a path leading from the right of the Bussey Hill Road above the Lilacs.

An illustrated guide to the Arboretum containing a map showing the position of the different groups of plants has recently been published. It will be found useful to persons unfamiliar with the position of the different groups of plants. Copies of this guide can be obtained at the Administration Building in the Arboretum, from the Secretary of the Massachusetts Horticultural Society, 300 Massachusetts Avenue, Boston, from The Houghton, Mifflin Company, 4 Park Street, Boston, and at the Old Corner Bookstore, Bromfield Street, Boston.

The Arboretum will be grateful for any publicity given these Bulletins.

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JUN 28 1911 Harvard University

No. 9

ARNOLD ARBORETUM

HARVARD UNIVERSITY

BULLETIN

OF

POPULAR INFORMATION



JAMAICA PLAIN, MASS.

JUNE 27, 1911

BULLETIN NO. 9.

The Chinquapin, *Castanea pumila*, is in flower about a week before the flowers of the northern Chestnut-tree appear. The Chinquapin is a native of the coast region of the Atlantic States from New Jersey to Florida. It is found also in the Gulf States and in the region west of the Mississippi River from southern Missouri to Texas. In the Atlantic States it is usually rather a low shrub spreading into thickets, but west of the Mississippi, especially in southern Arkansas and Texas, it grows into a large, round-headed tree, although it never becomes as large as the northern Chestnut-tree. A tree of this western form and a large group of the dwarf form originally from Virginia are established in the Arboretum and can be seen with the other Chestnuts on the right-hand side of the Valley Road just beyond the Hickory Group. The nuts of the Chinquapin are produced freely in the Arboretum every year and, unlike those of the northern Chestnut-tree, they are cylindrical, not flattened, as only one nut is produced in a bur, and are bright and shining and of even better flavor than those of the common Chestnut. The silvery under surface of the leaves, which is covered with fine hairs, also distinguishes the Chinquapin from the Chestnut-tree.

The black-fruited Elder, *Sambucus canadensis*, is the last of the native shrubs which make a conspicuous show of flowers in the New England landscape. It is just coming into flower in the neighborhood of the small ponds at the end of the Meadow Road and in the Shrub Collection where there are also some interesting varieties of this handsome plant. Among them the most conspicuous now is perhaps the variety with finely divided leaflets, var. *acutiloba*. This plant was found growing wild a few years ago in one of the western states and has been propagated by Messrs. Ellwanger & Barry, of Rochester, New York. Another variety, var. *chlorocarpa*, with yellow-green fruit, was found recently in southern New Hampshire. The variety *maxima*, which originated in a European garden, is a remarkable plant as it produces flower-clusters at least three times as large as those found on the wild plants and these are followed by such large and heavy bunches of fruit that the branches are hardly able to support them. The European *Sambucus nigra* and its variety with yellow leaves is also in flower, and the fruit of some of the early flowering species is already ripe. The bright red berries of *Sambucus pubens* from the northern part of this continent now make a fine show. There is in the collection a yellow-fruited form of this plant, var. *leucocarpa*, which although less beautiful is interesting. Interesting, too, although not so full of fruit this year as usual, is the Japanese form of the red-fruited *Sambucus racemosa* (var. *Sieboldii*) which is well established in the collection.

The Arboretum is indebted for no small part of its early summer beauty to four shrubby species of native Viburnums which have been planted in large numbers through its border plantations. The first of these to flower, *Viburnum dentatum*, has already shed its flowers which during the summer will be followed by great clusters of bright blue fruits. This is a common roadside and meadow shrub in the northeastern part of the country and, like several of the other American Viburnums, it improves with good cultivation, growing larger and producing better foliage and handsomer flowers and fruit. The second of this group of four species, *Viburnum cassinoides*, is also out of flower. This is a native of swamps and of the northeastern part of the country where it sometimes grows

twenty feet high. In cultivation this has proved one of the handsomest of all the *Viburnums* introduced into the Arboretum. The leaves, which are thick and lustrous, vary greatly in size and shape. The flowers are slightly tinged with yellow and are borne in large slightly convex clusters. The fruit is larger than that of the other species mentioned in this bulletin and, at first yellow-green, later becomes bright pink and finally blue-black and covered with a handsome pale bloom, fruits of the three colors at a certain period occurring together in the same cluster. The third of these species, *Viburnum venosum*, is now in full flower. This resembles *Viburnum dentatum* but it blooms a couple of weeks later and the young branches and the under surface of the leaves are covered with a thick coat of stellate hairs. This species is found growing naturally only in the neighborhood of the coast from Cape Cod and Nantucket to New Jersey. A larger and handsomer plant, with larger leaves, more showy flowers and larger, later-ripening fruits, is our fourth species, *Viburnum Canbyi*. This plant appears to be confined to eastern Pennsylvania and to northern Delaware where it is by no means common. This is the last of the *Viburnums* to open its flowers in the Arboretum where there are large specimens along the Meadow Road and in front of the Administration Building.

The Silky Cornel, *Cornus Amomum*, is now opening its small white flowers. This has been much used in the Arboretum borders but in cultivation it is not a satisfactory plant unless it can be given sufficient room for its wide-spreading branches to extend out freely and spread over the ground. When well planted it forms a handsome and symmetrical single specimen, and it is well suited for the front of groups of larger plants or for the margins of streams and ponds where its long branches can hang gracefully over the water. The purple stems are attractive in winter, and the bright blue fruits which ripen in the autumn add to the attractions of this native shrub. It is in the Cornel Group at the junction of the Meadow and Bussey Hill Roads where there are two southern species which will not be in flower for a week or two, *Cornus asperifolia* and *Cornus stricta*. The flowers of a Cornel useful as a flowering plant and of no little scientific value, *Cornus Arnoldiana*, are just beginning to fade. This is a hybrid between two native species and sprang up naturally in the Arboretum. The oldest plants are now ten feet high and nearly as broad with erect stems, and this year have been covered with flower-clusters which are handsomer than those of its parents, *Cornus racemosa*, or as it is still more often called, *Cornus paniculata* and *Cornus obliqua*. The flowers, however, are its chief beauty for this hybrid bears little fruit, and in the autumn it is less interesting than *Cornus racemosa* which is as beautiful in October when it is loaded with its white berries on bright red stalks as it is when the flowers open the middle of June.

The flowers of the earliest of the Azaleas, or Rhododendrons as botanists now call these plants, were open two months ago. Those of the last to flower in the long procession of these plants which can be cultivated in the Arboretum are just appearing. This last species is *Rhododendron (Azalea) viscosum*, the Clammy Azalea or, as it is often called, the Swamp Honeysuckle. This is an inhabitant of swamps in the eastern part of the United States, and is chiefly valuable as a garden plant in the delightful fragrance of the white, long-tubed, clammy, viscid flowers and in the

fact that it blooms late in the season. A mass of these plants can be seen on the edge of the native woods on both sides of the Meadow Road; it is also established on Azalea Path, and is scattered through the borders in different parts of the Arboretum. A handsomer plant and one of the most beautiful of all Azaleas is *Rhododendron (Azalea) arborescens*. This is an inhabitant of the Appalachian Mountains from Pennsylvania southward and is a tall shrub with leaves dark and shining above and pale below, with clusters of large white flowers the beauty of which is increased by the bright scarlet filaments of the stamens and styles which rise above the corolla. The fragrance of these flowers is like that of newly mown hay. This plant was introduced into English gardens more than a century ago but it appears to have been soon lost from them and from cultivation until 1880 when seeds were first sown in the Arboretum and from the Arboretum sent to Europe. A mass of this Azalea is established on the right-hand side of the Valley Road in front of the group of Hickories.

From the Valley Road and in other parts of the Arboretum may be seen the spikes of the yellow flowers of the Woad Wax, *Genista tinctoria*, as they rise among Wild Roses and other shrubs. This *Genista* is to admire but not to plant, for as the farmers of Essex County in Massachusetts know to their cost it may become a dangerous weed; as it has ruined many hundreds of acres by plants spread from those brought from England and first planted in Governor Endicott's garden in Salem.

The first of the shrubby Hydrangeas to bloom, *Hydrangea Bretschneideri*, is just opening its flowers. This is a large and hardy shrub from northern China and Manchuria, and in this climate is one of the best plants of the genus. It can be seen in the Shrub Collection and there is a large shrub near Mr. Dawson's house on Centre Street.

Attention is called to *Clematis tangutica* which is planted on one of the trellises on the east side of the Shrub Collection. This very hardy climber from the extreme western part of China has been in bloom for the past three weeks and the flowers will continue to open for sometime longer. They are vase-shaped and bright clear yellow, and as they fade are succeeded by heads of fruits with long, glistening hairy tails. As the flowers open gradually through several weeks flowers and fruits are on the plant at the same time. Among perfectly hardy vines recently introduced this is one of the best.

Of the plants now in flower in the Arboretum, however, there is not one more beautiful or more worthy of a place in every garden than *Magnolia glauca*, which is sometimes called the Sweet Bay. For nearly three weeks its cup-shaped, creamy white flowers have been opening and fading and they will continue to open for several weeks. Their fragrance fills the air, especially at sunset, about the Jamaica Plain entrance.

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Gray Herbarium
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No. 10

ARNOLD ARBORETUM

HARVARD UNIVERSITY

BULLETIN

OF

POPULAR INFORMATION



JAMAICA PLAIN, MASS.

JULY 5, 1911

BULLETIN NO. 10.

The Persimmon of the eastern United States, *Diospyros virginiana*, is rarely cultivated. This, however, is a perfectly hardy, fast-growing and shapely tree. The leaves are thick and leathery, dark green and shining above and pale below. The male and female flowers are produced on different individuals and are not conspicuous. They open when the leaves are nearly fully grown and are pale yellow, those of the female tree being about three-quarters of an inch long and nearly three times as long as those of the male tree. The fruit, which ripens late in the autumn and does not become sweet and succulent until after it has been touched by the frost, remains on the branches during the winter; it is globose or oblong, about two inches in diameter, pale orange color often with a bright red cheek and is covered with pale bloom. Occasionally plants with exceptionally large or well-flavored fruits have been propagated by nurserymen, but there is still opportunity to improve this fruit, which is one of the best produced by any North American tree. In New England the Persimmon grows naturally only in a few stations in southern Connecticut, but in the middle and southern states it is very common, often covering by means of its suckers barren fields, and springing up by the sides of roads and fences. As an ornamental tree and for the value of its fruit it should be more often planted. A group of this tree can be seen on the right-hand side of the Bussey Hill Road just beyond the Cornell Group. The tree nearest the road is a male and is now covered with flowers; the largest tree in the group is a female on which the young fruits are just beginning to form.

This is a good time to study the Grapevines on the trellis along the eastern side of the Shrub Collection as the leaves are now fully grown and the fruit is formed on some of the species, while on others the flower-buds have not opened.

Many of the early travelers in the northeastern part of North America spoke of the abundance and beauty of the Wild Grapevines and were enthusiastic over the wine that was to be made from the great store of grapes which they found hanging over lakes and streams and along the borders of the forest. These high hopes have not been realized and the fruit of the American Grapevines, with some notable exceptions, unless improved by the blood of the Old World wine grapes, is of little value. American Grapevines, however, have played a great part in restoring the vineyards of Europe ruined by the *Phylloxera* and among them are some of the most splendid ornamental vines of all temperate regions. No other vines are better suited to cover trellises and arbors, to climb high into old trees, to hang gracefully over walls and fences, to spread over rocks and to clothe barren slopes. The value of Grapevines for covering walls can be seen near the Jamaica Plain entrance, on the wall between the Jamaica Plain and the Forest Hill entrances, and on the Center Street wall, and their value for covering the ground can be seen at the corner of the Meadow and Hemlock Hill Roads opposite the Rhododendrons where there is a bed of Grapevines which are cut back close to the ground every spring. All the North American species which are hardy are growing in the Shrub Collection. Among the little known species best worth cultivation are perhaps *Vitis Doaniana* and *Vitis cinerea*. The first is a native of the Texas Panhandle where it was discovered a few years ago. This is a fast-growing plant and appears to be perfectly at home in New England. The leaves are large, thick and firm, and rather pale bluish green in color. The fruit, which grows in small clusters, is blue covered with a pale bloom and of fair quality. *Vitis cinerea*

is an inhabitant of the river banks of the Mississippi Valley from Illinois to Kansas and Texas and sometimes grows to a great size. This species bears very large leaves which are dark green and dull on the upper surface and ashy gray on the lower surface and, like the young shoots, are clothed when they unfold with a thick, felt-like gray covering. Some of the other species in the collection which should be studied by persons interested in handsome vines are *Vitis vulpina*, the Frost Grape, the species which grows the furthest north; *Vitis rotundifolia*, the Muscadine or Southern Fox Grape, often cultivated in selected forms in the southern states as the Scuppernong Grape; *Vitis monticola*, the Sweet Mountain Grape of the limestone hills of southwestern Texas; *Vitis rubra* or *palmata*, a slender graceful plant found from Illinois to Missouri, Louisiana and Texas; *Vitis arizonica*, with small, pale gray-green leaves; *Vitis aestivalis*, the Summer Grape of the middle states, with large leaves dark green above and covered below through the season with rusty brown hairs, and small blue-black berries; *Vitis bicolor* of the northern and middle states, a magnificent plant with large deeply-lobed leaves dark green on the upper surface and pale blue-green on the lower surface; *Vitis Labrusca*, the common Fox Grape of New England, with leaves covered below with tawny white, tan-colored, or red-brown felt and dull green above and large berries which vary in color from dark purple to reddish brown or amber color. The Delaware, Concord, and other well known table grapes are selected varieties of this species, and this is one of the parents of most of the hybrid grapes which are now largely cultivated in the United States. *Vitis cordifolia*, the Frost Grape, an inhabitant of the middle states, with thin leaves light green on both surfaces and with large clusters of small blue fruit which becomes edible after frost, is one of the largest and most vigorous of the American species, often growing into the tops of the tallest trees and forming stems from one to two feet in diameter. In spite of the beauty and value as ornamental plants of the American Grapevines which can be seen in the Arboretum it is impossible to obtain more than one or two of them in nurseries, as American nurserymen have not yet learned the value of these plants or that a demand for them exists or would exist if plants could be bought.

Among Old World Grapes the most interesting as ornamental plants are *Vitis Coignetiae* and *Vitis amurensis*; the first, which is an inhabitant of northern Japan, grows to a large size and produces enormous, thick, prominently veined leaves pale on the lower side which turn scarlet in the autumn. This is a very vigorous and hardy plant here, and for northern countries one of the most valuable of all the ornamental Grapevines. *Vitis amurensis* is a native of eastern Siberia and, although less vigorous than *Vitis Coignetiae*, it is a hardy and valuable plant for covering walls and trellises. The Chinese *Vitis Davidii* is interesting because, unlike the New World Grapevines, the stems are thickly covered with spines, a character which at one time caused French botanists to consider it the type of a new genus, *Spinovitis*. The leaves of this plant turn red in the autumn. In severe winters the stems are killed back to the ground. Equally curious, perhaps, is another Chinese Grapevine, *Vitis Pagnuccii*, with leaves which are sometimes shaped like those of an ordinary Grapevine and sometimes deeply and variously lobed much like those of the Virginia Creeper.

There are still a number of plants in bloom or still to bloom in the Shrub Collection, and these late-blooming shrubs are valuable and interesting because summer-blooming shrubs are not numerous. These flowering shrubs, the ripening of early fruits and the full development of the leaves

on most of the trees make a visit to the Arboretum in July interesting and important.

Among the shrubs now in bloom the most showy are perhaps the Hydrangeas, and of the species cultivated in the Arboretum *Hydrangea paniculata* is now the most conspicuous. The most generally planted of the forms of this plant is the one in which all the flowers are sterile, known as *Hydrangea paniculata grandiflora*. This plant produces large conical clusters of white flowers which turn rose color in fading; it will not be in bloom for several weeks. There are two other forms in which only a few of the flowers are sterile and are called ray flowers because they surround the clusters of small fertile flowers. These are the wild plants from which the form *grandiflora*, with all the flowers neutral, has been developed probably by long cultivation and selection in Chinese and Japanese gardens. There are two forms of this *Hydrangea* with perfect and ray flowers and one of these, variety *praecox*, is just coming into flower and the other, variety *tardiva*, will not be in flower for several weeks. There are three plants of the variety *praecox* in the collection, differing in the size of the flower-clusters and in the size of the ray flowers. The handsomest and the earliest of these was raised from seeds collected by Professor Sargent in Hokkaido where it grows into a small tree sometimes twenty or thirty feet tall. Individuals of two of the American species of *Hydrangea* have been found with sterile flowers only. The handsomest of these is the variety of *Hydrangea arborescens*, known as *grandiflora*. This plant was found a few years ago growing wild in one of the western states and has been largely distributed in this country and in Europe. It is a handsome hardy plant, of good habit, and it produces its large clusters of white flowers in great profusion. It is just coming into flower a few days before *Hydrangea arborescens* growing next to it. Of *Hydrangea cinerea* of the southern states there is also a form with all sterile flowers, the variety *sterilis*. This is also a good garden plant, blooming rather later than *Hydrangea arborescens grandiflora*.

Several shrubs of the Pea Family with yellow flowers are in bloom. Most interesting, perhaps, are the Coluteas, or Bladder Sennas, inhabitants of southern Europe, the Caucasus and Asia Minor. *Colutea arborescens* and *Colutea cilicica* are in full flower now, but *Colutea orientalis* is already covered with its large thin-walled inflated pods which are now tinged with pink and are more ornamental even than the flowers.

Three small yellow-flowered European shrubs are also in flower, *Cytisus nigricans*, *Cytisus capitatus* and *Genista elata*. These are all good garden plants not often seen in American collections. *Holodiscus discolor*, a near relative of the Spiraeas, is covered with its long drooping clusters of white flowers. This is a common shrub in the region west of the southern Rocky Mountains and one of the few shrubs of that part of the country which is perfectly at home in New England.

Of the Sorbarias, which are also of the Spiraea relationship, *Sorbaria sorbifolia* of eastern Siberia and Japan, and *Sorbaria stellipila* of Japan are in flower. These, like the other species of this Old World genus, are handsome shrubs with dark divided leaves and large erect clusters of small white flowers which remain for a long time in good condition.

Some of the Deutzias are still in flower. The handsomest of them now is perhaps the plant known as the Pride of Rochester, with flowers slightly tinged with pink. This is a form of *Deutzia scabra*, and other garden forms of this species now in bloom are the varieties *Watereri* and *Wellsii*.

The Arboretum will be grateful for any publicity given these Bulletins.

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No. 11

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JAMAICA PLAIN, MASS.

JULY 11, 1911

BULLETIN NO. 11.

The Arboretum is often asked to determine the names of European Elms and for information about these trees, particularly about the so-called English Elms. The subject is complicated for many varieties and several hybrids of these trees have been developed through long cultivation, and it is sometimes difficult to distinguish hybrids or forms due to cultivation from the original wild types of these trees. This difficulty is increased by the nearly complete destruction of the original forests of western Europe where of most species of trees only planted individuals can now be seen, and the wild types of the European trees must be looked for in the Balkan states or in the Caucasus.

There are in all Europe four species of Elm trees that can be readily distinguished. The confusion in regard to these trees goes back at least to the time of Linnæus who considered that all the European Elms belonged to one species to which he gave the name of *campestris*. This name, however, cannot be used for any one of the four species united by Linnæus as it is impossible to know which of the four he considered best deserving of the name. *Ulmus campestris*, therefore, as a name must be given up. This is unfortunate for the name is of old usage and is found in all books about trees.

Two Elm trees grow naturally and spontaneously in Great Britain, *Ulmus glabra* and *Ulmus nitens*, and these names, which are the oldest which have been applied to these trees, further complicate the situation. *Ulmus glabra*, which is often called the Scotch Elm, is a medium-sized, round-headed tree with stout hairy branchlets and large short-stalked leaves often three-lobed at the apex, and very rough, especially on the upper side, from the short rigid hairs which cover them. This tree can easily be distinguished also by the fruit in which the seed is in the center of the surrounding wing. It is a native of Scotland and northern England, and extends eastward to the Caucasus, eastern Siberia and Japan, where it is represented by a distinct form, the variety *heterophylla*. To the Scotch Elm several names have been given. The oldest and the one therefore which should be adopted is *Ulmus glabra*. This is an unfortunate name for the leaves are rougher than those of any other Elm tree, and *Ulmus scabra* and *Ulmus montana* which were given to it later are more appropriate names. The name *glabra*, however, as the author who first used it states, was given to this tree because the branches are smooth, that is because they do not produce the corky wings which are developed on the branches of many varieties of Elm trees. The Scotch Elm has been sometimes planted in the eastern United States but it is not a desirable tree. It does not produce suckers like many other Old World Elms, but it bears great quantities of seeds which are freely blown about and, growing rapidly, produce innumerable plants which may become troublesome weeds. In recent years, in the neighborhood of Boston, the leaves of this tree have been destroyed in early summer by the larvæ of a leaf-mining insect which works entirely under the epidermis of the leaf and cannot therefore be reached by an external application of poison. This insect is a good botanist and, selecting always this Elm, never feeds on any of the other species. Several varieties of the Scotch Elm are commonly cultivated. The best known, perhaps, is the Camperdown Elm, the variety *Camperdownii*. This is the tree with pendulous branches which is often planted in suburban gardens where, as the branches grow

regularly round the top of the stem and reach the ground, it makes a natural arbor. The variety *horizontalis* with irregularly spreading and more or less drooping branches is a handsomer tree but is less often seen in the United States. The Exeter Elm is a variety of this tree, var. *stricta*, with erect branches which form a narrow pyramidal head and is more curious than ornamental. The variety *macrophylla* is a form with exceptionally large leaves, and the variety *myrtifolia* has purplish leaves. The variety *superba*, which is perhaps a hybrid, is a large tree with a broad head of pendulous branches, and large, rather lustrous leaves, and is the handsomest of all the forms of the Scotch Elm.

The second species which grows in Great Britain, *Ulmus nitens*, is a taller tree with slender hairless branches sometimes furnished with corky wings, longer-stalked and smaller, smooth, shining leaves without hairs except occasionally on the under surface of the midribs, and fruit in which the seed is near the upper edge of the encircling wing. This tree produces suckers freely. It is a widely distributed tree, extending to the Caucasus and Siberia. It is not often found in American collections and it is hardly recognized by American cultivators of trees. There are several forms of this tree in cultivation. Perhaps the one most often seen is the variety in which the leaves are blotched with white, variety *variegata*, also called *argenteo variegata*. The Cornish Elm, with erect growing branches forming a narrow irregular head, is a variety of this tree. There is a variety with purple leaves, var. *purpurea*, sometimes called var. *corylifolia purpurea*; and there is an interesting form found a few years ago in Persia, the variety *umbraculifera*, with short branches forming a compact nearly globose head.

The third European species, *Ulmus laevis*, is found only in the northern part of the continent and is the commonest Elm of Scandinavia and northern Russia. This is a noble tree which sometimes grows to the height of one hundred feet, and is hardly distinguishable in habit and foliage from the American Elm although quite different from our tree in the long stems on which the flowers and fruit hang. Like the American Elm, the trunk and large branches are often clothed with small pendulous branches. This tree is probably extremely rare in American collections, although it might well be more often planted in the northern states. It is often called *Ulmus pedunculata* and *Ulmus effusa*.

The fourth European species merged by Linnæus in his *Ulmus campestris* is a tree from central and northern Europe for which the oldest name is probably *Ulmus foliacea*. This is a tall tree with slender branches often developing corky wings, small, smooth or rough leaves, and fruit in which the seed is near the middle of the wing or between the middle and the apex. This tree is not generally recognized in American collections, but it is usually *Ulmus foliacea* which comes to this country when seedling Elms, under the name of *Ulmus campestris*, are imported from French or German nurseries. The curious, dwarfed, small-leaved Elm called *Ulmus viminalis* is evidently a seedling variety of this species.

The Huntington Elm, *Ulmus vegeta*, is now believed to be a hybrid between *Ulmus glabra* and *Ulmus montana*, the two species which grow naturally in England where the Huntington Elm originated. It is a large tree with a short trunk and numerous large branches spreading at narrow angles, and in this country it grows more rapidly than any other Elm tree. It should be oftener planted here. *Ulmus major*, which is supposed to be a hybrid of the same parentage as *Ulmus vegeta*, is another noble tree which a hundred or a hundred and fifty years ago was

much planted in the suburbs of London. There is another Elm in Europe which is perhaps a hybrid but its parentage is uncertain, and it appears to be without an authentic name. This is the Elm which is planted in all the Dutch cities and, judging by its appearance in these cities, one it is of the best of all street trees. There are large trees in Holland, in the Champs Elysées in Paris, and at Versailles, so if it is a hybrid it is not of recent date.

When in Massachusetts we speak of *Ulmus campestris* we do not refer to any of the trees already mentioned in this bulletin but to the so-called Elm of the roadsides, avenues and hedge-rows in southern England. The origin of this tree is obscure. Growing spontaneously it is known only in England; it never ripens seeds, and it increases by suckers which are produced in profusion. Some authors have thought that it might be a hybrid; by others it has been suggested that it was brought from Italy to Britain by the Romans. It is a splendid tall long-lived tree with a massive trunk and erect or spreading branches. This is a tree which has grown to a larger size in Boston and its suburbs than any other planted tree. Major Paddock established a nursery of these trees at Milton in the eighteenth century and the Paddock Elms, once the glory of Tremont Street, and the so-called English Elm trees which once stood on Boston Common are of this form. The oldest name for this tree is *Ulmus surculosa*. All these Elms, and many other species, hybrids and varieties in small individuals can be seen on the northeastern slope of Bussey Hill. *Ulmus surculosa* is common near Boston. *Ulmus glabra* and some of its varieties are not uncommon in this neighborhood, and occasionally plants of *Ulmus nitens* and *Ulmus foliacea* can be found in eastern Massachusetts. As these last are usually raised from seeds in European nurseries the imported seedling plants show great variation in habit, foliage and in the presence and absence of wings on the branchlets.

Two of the trees of eastern Asia are now in bloom. *Koelreuteria paniculata* is a native of northern Japan and is often planted in the gardens of Peking. It is a medium-sized tree with compound leaves and large erect clusters of bright yellow flowers. This is a valuable tree for it is very hardy, the foliage is handsome and the flower-clusters appear after the flowers of nearly all trees have passed. It is to be seen on the right-hand side of the Meadow Road between the Evonymous Group and the Horsechestnuts.

The second of the Asiatic trees in flower, *Maackia amurensis*, belongs to the Pea Family and is a native of eastern Asia. It is a small tree with orange-brown bark, dull green compound leaves, and short erect clusters of small yellowish white flowers. Botanically it is a nearer relative of the North American Yellow-wood or Virgilia, *Cladrastis lutea*. It has sometimes been supposed to belong to the genus *Cladrastis*, from which it differs, however, in the winter-buds, in the inflorescence and in the bark and wood. As an ornamental tree it is in every way inferior to its American relative, and it is only of botanical interest. Two trees of *Maackia* can be seen on the right-hand side of Bussey Hill Road at the top of the Heath Family Group.

The Arboretum will be grateful for any publicity given these Bulletins.

No. 12

ARNOLD ARBORETUM

HARVARD UNIVERSITY

BULLETIN

OF

POPULAR INFORMATION



JAMAICA PLAIN, MASS.

JULY 18, 1911

BULLETIN NO. 12.

From this time until April of next year the Arboretum will be interesting from the fruits which are to be seen here. Nothing so surprises and delights European visitors who come to the Arboretum in summer and autumn as the profusion of showy fruits which are produced here by many trees and shrubs. The Arboretum has done a useful service in bringing together all the wild forms of the plants which bear showy fruits, and in making known their value as ornaments of American gardens; and among the Crabapples, Plums, Cherries, Roses, Currants, Cornels, Privets, Buckthorns, Barberries, Elders, Hawthorns, Elæagnus, Celastrus, Evonymus, Panax, and other plants with fleshy fruits the student and the gardener in search of useful plants will find here now and for several months much to investigate.

The Bush Honeysuckles are now the handsomest plants with ripe fruits. They produce fruit in great quantities and it remains in good condition for several weeks. On different species there are blue, black, orange, yellow, crimson and scarlet fruits; and the fruit of some of the hybrids is more beautiful than that of their parents. The orange-yellow translucent fruit of *Lonicera minutiflora* is perhaps now the most beautiful in the collection. This plant is a hybrid between one of the Tartarian Honeysuckles (*Lonicera tartarica*) from central Asia and *Lonicera Morrowii* from eastern Siberia. Another handsome plant now is *Lonicera muscaviensis*, with large and translucent scarlet fruit. This is a hybrid between two species of eastern Siberia, *Lonicera Ruprechtiana* and *Lonicera Morrowii*. Other plants now covered with ripe fruit are the Tartarian Honeysuckle and its yellow-fruited variety; *Lonicera bella* and *Lonicera notha* with crimson fruit; *Lonicera Morrowii* with dull crimson fruit; *Lonicera xylostyum* with large, dark crimson, lustrous fruit, and *Lonicera xylostyoides* with large red fruits. On other species the fruit is not yet half grown, so that for a long time there will be much of interest to see in this collection which is one of the most complete in the Arboretum.

The fruits of some of the Chokecherries in the group at the entrance of the Shrub Collection close to the Forest Hills Gate are beginning to ripen. The most unusual is the yellow-fruited form (var. *leucocarpa*) of the eastern Chokecherry, *Prunus virginiana*. This yellow-fruited Cherry is common in some parts of the Province of Quebec and occasionally reaches the Canadian markets. The fruit is large, light yellow, translucent and of a better flavor than that of the common Chokecherry.

The fruit of *Elaeagnus longipes* still remains on the branches, although it has been ripe for several weeks. This hardy Japanese shrub flowers and fruits here profusely. The fruit hangs gracefully on long slender stems and is oblong, scarlet, lustrous and covered with small, white dots. It has a tart and rather agreeable flavor. This plant can be seen on the left-hand side of the Bussey Hill Road above the Lilacs in the Elæagnus Group.

The white fruits of *Cornus stolonifera*, the Red Osier Dogwood or Cornel of eastern North America and its yellow-fruited variety (var.

flavoramea), and *Cornus Baileyi* are now ripe, while the flowers on the other species of the group have not yet faded. Handsomer even than the fruit of these species are the pale blue fruits of *Cornus rugosa* or *circinata* which, although now nearly fully grown, will not ripen for a few weeks. This is one of the most ornamental of the native Dogwoods, with large, round, oval leaves pale on their lower surface and large flat clusters of pale yellow flowers.

The abundant fruits of *Viburnum americanum*, the so-called High-bush Cranberry of the northeastern part of the country, are now more than half grown and light yellow; later they will become scarlet and very lustrous and continue to ornament the plants until spring.

There are not many more trees to flower this year. Flowers still continue to open occasionally on *Magnolia glauca* and rain will probably produce a second crop of flowers on *Magnolia cordata*. These plants are on the right of the Jamaica Plain entrance.

The Sorrel-tree, *Oxydendron arboreum*, is just opening its flowers which are borne in large terminal panicles. This is one of the interesting North American trees and is the only representative of an Appalachian genus. The long, narrow leaves are dark green and shining, and have a strong acid flavor to which this tree owes its name. Hardy, fast-growing, late-flowering, with handsome flowers, and foliage splendid in the autumn, and saved apparently by its acid juices from the attacks of insects, this tree is too little known. It can be seen at the eastern base of Hemlock Hill on the left-hand side of Hemlock Road where several individuals are growing among the *Kalmias*.

Sophora japonica is now covered with flower-buds, but the small pea-shaped, white flowers will not open probably for two or three weeks. This tree is a native of China but first reached Europe and the United States from Japan where it was introduced by Buddhist priests more than a thousand years ago. It is a very hardy tree, of good habit, with dark green leaves and branchlets, and the fact that it flowers late in the summer adds to its value. It grows to a larger size than any of the trees which have been planted in Peking, and the old trees there from a distance look like venerable Oaks. There are a few large individuals in Europe where it was first planted more than one hundred and fifty years ago, but it is not very often seen in this country. In the Arboretum it is growing on the right-hand side of the Bussey Hill Road opposite the upper end of the Lilac Group. There is a large specimen in the Public Garden of Boston.

Of summer-flowering shrubs the handsomest now in bloom is *Stuartia pentagyna*. This plant belongs to the same family as the Camellia, and the white cup-shaped flowers are not unlike those of a single Camellia. This is a native of the southern Appalachian region and very hardy in the Arboretum. *Stuartia pseudocamellia*, a native of the mountains of Japan, is a taller plant, tree-like in habit, with rather smaller flowers. It is not yet in flower. These plants can be seen in the Shrub Collection.

Another plant now in flower in the Shrub Collection, *Amorpha canescens*, or the Lead Plant, deserves attention. This is a member of the Pea Family with leaves and stems whitened with hoary down and small

violet-colored flowers crowded in clustered terminal spikes. This striking looking plant grows three or four feet tall and is a native of the middle west where it grows on hills and prairies from Indiana to Minnesota and southward.

The last of the Horsechestnuts to flower, *Aesculus parviflora*, is now covered with its long, narrow, erect spikes of small white flowers. This is a broad, round-topped, shapely shrub well suited for planting in large masses or as a single specimen. In good soil and uncrowded by other plants it soon spreads over a large area. A native of the southeastern states where it is found from South Carolina to Florida and Alabama, this Horsechestnut is perfectly hardy in New England, and in cultivation at the north it grows into a larger and a finer plant than in its native wilds. There is a mass of these plants at the northern base of the wooded hill on the right-hand side of the Meadow Road and in the rear of the Horsechestnut Group.

One of the handsome shrubs of eastern North America, the Spice-bush, *Clethra alnifolia*, will not be in bloom before the end of the month, although its flower-buds are already well developed. The white fragrant flowers are produced in erect terminal spikes and contrast beautifully with the dark green leaves. Masses of this shrub, which lends itself perfectly to cultivation, have been planted in the borders along the Meadow Road.

Panax sessiliflorum is just opening its flowers which are small and inconspicuous, and are borne in globose, compact, terminal heads. This is a large, hardy and vigorous shrub from eastern Siberia, with dark green divided leaves and black showy fruits which form large clusters at the ends of the branches and, remaining in good condition until late in the winter, are very conspicuous on the naked branches. A useful plant for public parks and wherever there is space for its wide-spreading branches to extend, this member of the Aralia Family is still little known. With the other members of this family it can be seen close to the pond on the right-hand side of the Meadow Road between the Witch Hazel Group and the Cornel or Dogwood Group.

These bulletins will be discontinued through the remainder of the summer.

An illustrated guide to the Arboretum containing a map showing the position of the different groups of plants has recently been published. It will be found useful to persons unfamiliar with the position of the different groups of plants. Copies of this guide can be obtained at the Administration Building in the Arboretum, from the Secretary of the Massachusetts Horticultural Society, 300 Massachusetts Avenue, Boston, from The Houghton, Mifflin Company, 4 Park Street, Boston, and at the Old Corner Bookstore, Bromfield Street, Boston.

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ARNOLD ARBORETUM

HARVARD UNIVERSITY

BULLETIN

OF

POPULAR INFORMATION



JAMAICA PLAIN, MASS.

OCTOBER 17, 1911

BULLETIN NO. 13.

A visit to the Arboretum at this time should be valuable to persons interested in seeing the plants best suited for the autumnal decoration of American gardens, for now many little known trees and shrubs here show the brilliant tints of their fading leaves and the beauty of their ripening fruit.

The contrast in the appearance of the trees and shrubs of eastern North America and eastern Asia with those of Europe at this time of year is interesting. The leaves of the former are now for the most part brilliantly colored or have already colored and fallen, while the leaves of the trees and shrubs of Europe are still green, and in the case of many of these plants the leaves finally wither and fall with little or no change of color. This interesting fact is best seen in the species of the same genus. The American Beech now lightens the woods with the light yellow tints of its leaves, while the leaves of the European Beech are still almost as green as they were at midsummer. The leaves of the American Elm have already shriveled or fallen except in the case of vigorous trees which still show the yellow tints of autumn, while the leaves of all the forms of the European Elms are still fresh and green.

This habit of European plants to retain their foliage late into the autumn is well illustrated by the Viburnums. The leaves of *Viburnum Lantana*, the Wayfaring-tree of Europe, are still either dark green or only slightly tinged with red along the margins, while the North American *Viburnum Lentago*, *Viburnum prunifolium* and *Viburnum cassinoides* are splendid in their autumn dress, which is set off by their abundant dark blue fruits. The contrast is even more marked in the Viburnums of the *Opulus* group. In this group the leaves of the European *Viburnum Opulus* are still dark green and as fresh as in July; those of *Viburnum americanum*, the native High-bush Cranberry, so-called, have turned to shades of yellow and red and are falling fast, while those of *Viburnum Sargentii* from northeastern Asia, which were bright orange-red two weeks ago, have now almost disappeared.

The slender branches of a Japanese Cherry, *Prunus Maximowiczii*, are already leafless, and the leaves of another Japanese Cherry, *Prunus Sargentii*, having turned deep orange-red, are now slowly falling, while all the European Cherries are still green. The leaves of all the forms of the Common Lilac derived from a species native to the mountains of Bulgaria drop without change of color, as do those of the large bush Honeysuckles which are mostly European and Siberian. Of the Lilacs, although the leaves of the Chinese *Syringa villosa* turn dull yellow in the autumn, only the Chinese *Syringa oblata* has real value for the autumn color of its leaves. These are large, thick, leathery and lustrous, and in the autumn turn to beautiful shades of dark red or old leather color, a habit which adds greatly to the value of this fine plant as an ornament of gardens.

Few Old World Roses make much show of autumn color but just now there is hardly a more beautiful plant in the Arboretum than the common Rose of the coast region of the northeastern United States, *Rosa virginiana*, or *lucida* as it is sometimes called, which just now makes a brave show with its leaves of orange and bright red.

Among the shrubs in the Arboretum which should be carefully studied at this time on account of the beauty of their autumn foliage are a few which deserve special attention. Of these *Evonymus alatus* from Japan is especially interesting for its leaves are now of a light rose color which is not found in those of any other plant in the collection. This is a broad flat-topped shrub of open habit, peculiar in the broad wings which are developed on its branches and to which it owes its name. As a flowering plant it has little to recommend it and the fruit is less conspicuous than that of most of the other Burning Bushes, as *Evonymus* is often called, but the color of the autumn foliage entitles it to a place in any garden. A large specimen of this plant can be seen in the *Evonymus* Group on the right-hand side of the Meadow Road. In this group are several other plants which are attractive at this time. The most conspicuous now, perhaps, is *Evonymus Bungeanus*, a small tree from northern China, covered with small light pink fruit which is set off by the pale yellow leaves. *Evonymus yeddoensis* and *Evonymus Hamiltonianus*, two Japanese shrubs or small trees, are now conspicuous also for their colored leaves and brilliant fruits.

Brilliant now are the scarlet fruits of the aromatic Sumac, *Rhus aromatica*, which has been planted freely in great masses along the drives. Beautiful, too, along many of the drives are plants of *Aronia nigra*, one of the Chokeberries of the eastern United States with its clusters of large drooping black fruits and dark red foliage. Of the native shrubs, however, none now are as brilliant as the High-bush Blueberry, *Vaccinium corymbosum*, which is conspicuous in the brilliant scarlet of its leaves in many parts of the Arboretum. This is one of the most ornamental shrubs of eastern North America. It grows into a large bush sometimes eight or ten feet high; the habit is good; the flowers are attractive and produced in profusion; and the fruit, which surpasses that of the other Blueberries and Huckleberries in size and quality, is bright blue, and in the autumn no other shrub is more beautiful. This is a plant to cultivate generally for its fruit and as an ornament of the garden. Like other plants of the Heath Family, it is not easy to raise from seed but small plants from the swamps can be readily established in ordinary garden soil.

Flowers are scarce in the Arboretum the middle of October. A few belated flowers may still be found on the clumps of Heather, *Calluna vulgaris*, in the Shrub Collection and among the Rhododendrons at the base of Hemlock Hill. This evergreen plant, a native of northern Europe, is too little known in American gardens, although it is perfectly hardy in New England. It has become completely naturalized at Townsend, Massachusetts, near the New Hampshire line, where grown from seed scattered some forty years ago, it has spread over an area of nearly forty acres, and it is well established, too, in larger masses, near

Halifax, Nova Scotia. The Heather should be planted in well-drained soil and in stations fully exposed to the sun where it will soon spread into large masses and remain in flower for two or three months. There are a number of varieties of this plant, the best known being that with white flowers. The white-flowered form grows wild in Europe, and it is supposed to bring good luck to the person fortunate enough to find it.

The native Witch Hazel, however, *Hamamelis virginiana*, is the only plant which really flowers in the Arboretum in the late autumn. Its small clusters of flowers with their long pale yellow strap-shaped petals are now partly hidden by the large leaves which are bright yellow and very conspicuous. As the leaves fall the flowers are seen to cover the branches and form one of the most interesting features of the autumn flora of the northern United States. Unlike our northern species, the Witch Hazels of Japan and the species lately discovered in southern Missouri produce their flowers in winter or very early spring before the appearance of the leaves. The Witch Hazel Group, containing also *Parrotia* and *Liquidambar* of the same family, can be seen on the right-hand side of the Meadow Road near its junction with the Bussey Hill Road.

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RECEIVED Gray Herbarium
OCT 25 1911 Harvard University

No. 14

ARNOLD ARBORETUM

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OF

POPULAR INFORMATION



JAMAICA PLAIN, MASS.

OCTOBER 24, 1911

BULLETIN NO. 14.

The Arboretum is often asked for information about a class of plants which in distinction from conifers are popularly called "broad-leaved evergreens." The general absence of these plants from the gardens of the northeastern United States astonishes European visitors to this country, and their prominence in the gardens of Great Britain, Italy, and other temperate parts of Europe often makes American travellers in those countries despondent over the possibility of having really good gardens here; the prominence, too, which has been given in late years here to architecture in garden-making has increased the demand for these broad-leaved evergreens, for they are essential for the decoration of a true architectural garden. This, however, is not a country where many of these plants can be successfully cultivated. The winters are too cold, the leaves give up too much moisture to March winds when the roots are still inactive in frozen soil, and the summers are too hot and dry.

The *Ilex* (*Quercus Ilex*), the chief ornament in the gardens of Italy, the so-called Laurel of English gardens, and the Portuguese Laurel, which are such only in name, being really evergreen Cherry-trees, the Bay and the Laurestinus, unless cramped in pots, will never be seen in American gardens. This is a region for plants which lose their leaves in the autumn and here many of these plants flourish as in no other part of the world.

The number of broad-leaved evergreens which can really be depended on in eastern Massachusetts is small. The most important are the Rhododendrons and the *Kalmia* or Laurel. The most successful here of all the plants of this class is the broad-leaved Laurel, *Kalmia latifolia*. It is hardier and less particular about soil, and easier to cultivate than even the hardiest Rhododendrons, like *Rhododendron maximum* and *Rhododendron catawbiense*; and, moreover, it is one of the most beautiful flowering plants in the world. The little native Sheepkill Laurel, *Kalmia angustifolia*, and the less well known *Kalmias* of northern swamps, *K. polifolia* and *K. microphylla* are broad-leaved evergreens also, although these plants are seldom cultivated. The Laurels, like the Rhododendrons and other plants of the Heath Family, cannot be grown in soil strongly impregnated with lime, so their use is restricted to a comparatively small part of the country. To the Heath Family we are indebted for a few other plants of this class. The handsomest of these is *Pieris* or *Andromeda floribunda*, a broad low bush with small dark green leaves and abundant conspicuous clusters of dull white flowers. This plant grows naturally on a few of the high mountains of the southern Appalachian region and has been long known in gardens. It is very hardy here and, after the *Kalmias* and Rhododendrons, perhaps the most desirable of the broad-leaved evergreens for this region. A Japanese species, *Pieris japonica*, which in Japan sometimes attains the size of a small tree, is also hardy, but it blossoms early in the season, and the flowers, which are larger and handsomer than those of the native species, are too often destroyed by frost.

As an under shrub in shady places, for it does not bear exposure to the sun, is another plant of the Alleghanies, *Leucothoe Catesbyi*, which is perfectly hardy. It has slender arching stems, which grow to the height of several feet and are clothed with large, lustrous, pointed leaves, and the white flowers in axillary clusters are abundant and attractive. To this Family, too, belong the Wintergreen, or Checkerberry, *Gaultheria procumbens*, and the Trailing Arbutus or Mayflower, *Epigaea repens*, but these are difficult to cultivate and probably will never take much place in the general garden decoration. More generally useful is another plant of the same Family, the Bearberry, *Arctostaphylos Uva-ursi*, which with its long prostrate stems forms a great mat on sandy and gravelly banks in the northern states and in northern Europe. Although rarely cultivated in this country, this is an excellent plant for covering poor soil and just now its bright red fruits make a handsome contrast with the small light green shining leaves.

Interesting, too, among broad-leaved evergreens is *Gaylussacia brachycera*, the Box-leaved Huckleberry. This is one of the rarest shrubs of the eastern United States, being found in three stations only, for it is known to grow naturally only in southern Pennsylvania, southern Delaware, and in West Virginia. It is found in dry soil in the shade of the forest, spreading over considerable areas by its underground stems. This plant grows only a few inches high, but it is very hardy, adapting itself readily to cultivation, and in the Arboretum grows as well in full exposure to the sun as it does in the shade.

The Ledums, or as they are popularly called Labrador Tea, are small evergreen plants of the northern hemisphere related to the Rhododendrons. Two or three of the species are hardy but difficult to cultivate and require especial care in selected positions; and this is true of two other small evergreen shrubs of the Heath Family native to eastern America, *Leiophyllum buxifolium* of the pine barrens from New Jersey southward, and *Loiseleuria procumbens* of the alpine summits of the White Mountains and northward.

The Old World Holly-tree, *Ilex aquifolium*, which in many forms is often one of the chief ornaments of European gardens, is not hardy here and its American relative, *Ilex opaca*, a native of the Massachusetts coast and southward, with dull leaves, is a much less beautiful plant. It is, however, the only broad-leaved evergreen which becomes a tree in New England. The Inkberry, *Ilex glabra*, a common shrub in the coast region from Nova Scotia to Texas, where it is found usually in poor soil, is one of the best of the broad-leaved evergreens hardy here, although its small black fruits are nearly covered by the shining foliage. It is more valuable here than the Japanese black-fruited Holly, *Ilex crenata*, although some forms of this plant are fairly hardy here.

The Ivy, unless carefully protected, cannot be successfully grown east of Cape Cod although at Providence, only forty miles from Boston, where the influence of the Gulf Stream is more strongly felt than it is here, the Ivy is perfectly hardy; and we have as an evergreen vine only the forms of the climbing Japanese Evonymus, *Evonymus radicans*. These plants are perfectly hardy when once established; they grow rapidly and although not so beautiful a covering for walls as the Ivy, they are our

only substitute for it. The best form is the var. *vegetus* which was introduced many years ago into the Arboretum from northern Japan. This form has broader leaves than the others, and flowers and produces its fruit more freely.

The Mahonias, or evergreen Barberries of our northwestern coast and of Japan and the Himalayas, are not hardy here except in favorable positions, and cannot be recommended for general cultivation; and of these plants we can depend only on the dwarf species of the Rocky Mountains, *Berberis* or *Mahonia repens*. This plant grows only a few inches high and the leaves are lighter green and less lustrous than the better known Oregon Grape, *Berberis* or *Mahonia Aquifolium*.

Two little shrubs of the Celastrus Family must be included in this list. These are *Pachystima myrsinites* of the Rocky Mountains and *Pachystima Canbyi* of the mountains of West Virginia. The former is widely distributed and a common plant in its region. It grows to the height of from twelve to eighteen inches and its leaves resemble those of some of the forms of the Box. It is, however, less hardy here than its Virginia relative which in the Arboretum forms a broad mass of small leaves only a few inches high and does not suffer from full exposure to the sun.

The different forms of the Box-tree of the Orient, *Buxus sempervirens*, except in exceptional positions, are not hardy in eastern Massachusetts, although west of Cape Cod many of them can be successfully grown, and only the little known Japanese species *Buxus japonica* seems really hardy here.

This completes the short list of broad-leaved evergreens which can be grown in eastern Massachusetts unless the Heather, one or two species of Heath, the stemless forms of Yucca and the Chamaedaphne, or Leather Leaf, can be called broad-leaved evergreens. This last plant, which is common in northern swamps, holds some of its leaves until spring. Although it grows naturally in wet ground, it does well when transferred to drier situations. Among the evergreens might almost be inserted, however, *Magnolia glauca*. In the south this tree, which grows much larger there than it does in the north, retains its leaves until late into the spring, but here they do not lose their beauty and do not fall until December.

An illustrated guide to the Arboretum containing a map showing the position of the different groups of plants has recently been published. It will be found useful to persons unfamiliar with the position of the different groups of plants. Copies of this guide can be obtained at the Administration Building in the Arboretum, from the Secretary of the Massachusetts Horticultural Society, 300 Massachusetts Avenue, Boston, from The Houghton, Mifflin Company, 4 Park Street, Boston, and at the Old Corner Bookstore, Bromfield Street, Boston.

The Arboretum will be grateful for any publicity given these Bulletins.

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Gray Herbarium
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JAMAICA PLAIN, MASS.

OCTOBER 31, 1911

BULLETIN NO. 15.

For persons who are interested in the showy fruits of trees and shrubs which remain on the branches until late in the autumn or through the winter this is a good time to study the American species of Hawthorns (*Crataegus*), although the leaves of many of these plants have already fallen. A large part of the species in the collection on the eastern slope of Peter's Hill were not known ten years ago and many of these plants are still too small to produce fruit, and now the most interesting American Hawthorns in the Arboretum are on the bank just east of the Shrub Collection and easily reached from the Forest Hills Gate.

The handsomest American species to be seen here now is *Crataegus nitida*, one of the best garden plants of the genus as it is represented in North America. It is a native of the bottom-lands of the Mississippi River in Illinois opposite St. Louis where it grows into a tree of considerable size for a Hawthorn. It is flat-topped with wide-spreading branches; the leaves are dark green and very lustrous; the small flowers are produced in innumerable clusters, and the fruit of medium size which now covers the trees is orange-red, long persistent and makes a good contrast to the bright red and yellow leaves which have hardly begun to fall.

Crataegus coccinioides and *C. fecunda* from the neighborhood of St. Louis, like *C. nitida*, have been growing in the Arboretum for thirty years and are now broad bushy trees covered with fruit, although the leaves are beginning to fall. *Crataegus coccinioides* has large broad leaves and very compact semiglobose clusters of large flowers which are followed by large dull red globose fruits, which are also in compact clusters and are produced every year in great confusion. *Crataegus fecunda* is one of the so-called Cock-spur Thorns with large, thick, shining leaves, rather small flowers, and large, oblong, drooping, shining fruits which do not all fall until winter.

Crataegus pruinosa can also be seen here covered with fruit although the leaves are gone. This small tree is the type of one of the distinct and most widely distributed groups of the genus, the Pruinosae, which are distinguished by their large showy flowers, thick leaves and fruit which matures late in the autumn without becoming soft, sometimes remaining green and sometimes turning bright red and usually covered with an abundant glaucous bloom. On *Crataegus pruinosa* the large, depressed, globose fruits turn bright scarlet and remain on the branches in good condition until late in the season; these, as well as the large blue-green leaves and the large flowers with the bright rose-colored anthers of the twenty stamens, which are produced in wide and abundant clusters, make this a desirable ornamental plant.

Equally handsome but quite different in appearance is *Crataegus succulenta*, one of the Tomentosae Group. This is a late-flowering species with small flowers in broad flat-topped clusters; these are succeeded by globose fruits drooping on long stems, and until October remain small and hard but later, and when fully ripe, enlarge and become deep scarlet with soft, orange-colored, succulent flesh, and in this condition are soon eaten by birds.

On this bank and close to the boundary wall is a plant of *Crataegus Carrierei*. This small tree is of doubtful origin, all the individuals having been obtained from a single seedling which appeared spontaneously several years ago in the nursery of the Jardin des Plantes in Paris. In some ways it resembles some Mexican species and it might be Mexican did not its hardiness in the Arboretum indicate that its home was in a colder country than Mexico. The fact that seedlings are identical with the parent seems to preclude the idea of hybrid origin; but whatever this may have been *Crataegus Carrierei* is an ornamental plant of the first class. It is now covered with its thick, pointed, lustrous leaves which are still green or only slightly tinged with yellow and which set off to advantage the large, light orange-red oblong fruits which are produced in great abundance.

Very beautiful, too, now is the Washington Thorn, *Crataegus cordata*, of the foothill region of the southern Appalachian Mountains and of southern Missouri, although it will be more beautiful probably a fortnight later when the leaves will have taken on their bright autumn colors of orange and scarlet; now they are just beginning to turn red and the shining surface contrasts beautifully with the small round scarlet fruits. The Washington Thorn should be more generally planted for it has much to recommend it. It is a slender, narrow tree sometimes thirty feet tall; it is one of the latest of the Hawthorns to flower and the flowers, which are not large and dull white in color, are produced abundantly. The leaves are small and nearly triangular, and the fruit, which ripens in October, remains in good condition on the trees until spring. The only objection to this tree is the brittleness of the branches which are often split or broken by severe storms.

On the left-hand side of the Peter's Hill Road, going from the Hemlock Hill Road across Bussey Street and between a large White Oak and the group of Crabapples, is a collection of shrubby Hawthorns. Some of these, like *Crataegus Buckleyi*, *C. foetida*, *C. apposita*, *C. nemoralis*, etc., are old enough to show their habit, and the beauty of their autumn foliage and of their fruits. The plants of this group, which is called *Intricatae* from the first species described in it, are all small shrubs, or occasionally small trees in the south, with very large flowers and large, highly colored fruit. Species in this group are found from New England to Georgia, and to Ontario, Michigan and Missouri; they appear to be most abundant in Pennsylvania, but are rare in the West. Until a dozen years ago they had been entirely overlooked by American botanists and were unknown in gardens, with the exception of *Crataegus intricata*, which had been grown and described in the Botanic Garden at Copenhagen. Nearly all the species which are known are well established in the Arboretum and promise to become an important contribution to American gardens in which their dwarf habit, large flowers and handsome fruits will make them valuable.

A few plants in the Arboretum are still conspicuous for the beauty of the autumn color of their leaves. The most conspicuous, perhaps, is *Parrotia persica*, a member of the Witch Hazel Family and a native of the Trans-Caucasus and Persia. Sometimes a small tree, it here grows in the form of a high broad bush. The flowers and the fruit are not conspicuous but the leaves, which in shape resemble those of the native Witch Hazel, are now splendid with tints of clear yellow, orange and red. A plant can be found in the Witch Hazel Group near the junction of the

Meadow and Bussey Hill Roads, and there are three larger plants on Hickory Path near the Centre Street wall.

A handsome plant in flower, the value of *Fothergilla major* of the Appalachian Mountains is increased by the autumn color of the leaves which are now light orange and red. Plants may be seen to advantage on Azalea Path and in the Shrub Collection.

The handsomest, perhaps, of the Barberries which have been successfully cultivated in the Arboretum is the Japanese *Berberis Regeliana*. This plant was introduced into the United States many years ago by the Parsons Nursery at Flushing, Long Island, and was distributed under the name of "Hakodate." It is a medium-sized shrub with large pale yellow flowers in long clusters, and large thick leaves which turn in the autumn to brilliant shades of orange and red, and handsome showy fruits. The leaves are now falling rapidly but the fruit will remain on the branches for several weeks longer. Large plants of this Barberry can be seen in the Barberry Group on Hickory Path. In this Group and in the Shrub Collection are plants of the Japanese *Berberis Sieboldii*, with dull deep red leaves, and two Chinese species just beginning to take on their autumn colors, *Berberis diaphana* and *B. dictyophylla*. The former is a compact, low, round-topped shrub with large solitary flowers and fruits, and leaves which in the late autumn are hardly surpassed in the brightness of their scarlet tints. *Berberis dictyophylla* is a taller shrub with erect branches and just now the red on the upper surface of the small spiny leaves contrasts finely with the silvery color of their lower surface. These three Asiatic species, which are still rare in gardens, deserve more general cultivation.

The autumn colors of the leaves of the Yellowroot, (*Xanthorrhiza apiifolia*), a pale canary yellow and green, add to the value of this useful little plant which has been largely used as an undershrub along several of the drives in the Arboretum. It is admirably suited for this purpose as it rarely grows more than a couple of feet high and spreads rapidly into dense masses which take entire possession of the ground. The small purple flowers which appear before the leaves and the fruits do not make much show, but the color of the foliage is good throughout the season.

Among the large number of Cotoneasters which have recently come to the Arboretum from western China *Cotoneaster Dielsiana* has become well established and promises to be a valuable decorative plant in this climate. It is a shrub with arching stems and branches which just now are covered with bright red fruits and small leaves which have turned deep bright reddish purple. A plant of this interesting shrub can be seen on Hickory Path in front of the Centre Street wall.

The slender leafless branches of *Callicarpa japonica* are now covered with the small violet-colored fruits of this hardy shrub which is a desirable addition to northern gardens, although the fruits are smaller and less showy than those of the American species, the so-called French Mulberry of the southern states which is not hardy here, and of several of the Asiatic species which are not yet established in the Arboretum. A group of these plants will be found on the left-hand side of Azalea Path close to its entrance from the Bussey Hill Road.

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ARNOLD ARBORETUM

HARVARD UNIVERSITY

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NOVEMBER 8, 1911

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The poverty of the gardens of the northeastern United States in broad-leaved evergreens, due to our climatic conditions, was shown in a previous bulletin, and we shall now mention a few plants which retain their foliage unchanged in color until late in the season. By the use of such plants it is possible to make a garden which will appear during October and November almost like a garden of broad-leaved evergreens. Most of these plants have come from Europe, although a few Chinese and North American shrubs retain green foliage through November.

One of the best known plants of this class is the European Buckthorn, *Rhamnus catharticus*. This is a large shrub, or in favorable positions a small, round-headed tree. The leaves are now bright green and the branches are covered with small black berries. This is a very hardy, fast-growing shrub, and when gardeners had less material to choose from than they have now it was often planted in this country. Now it is rarely seen except in plantations made many years ago. This is true of another European shrub, *Ligustrum vulgare*, the common Privet. This was once much planted in the eastern United States, especially in forming hedges, and it has always been used in Europe for this purpose. In recent years, however, it has been neglected here in favor of some of the Privets introduced from eastern Asia, although none of these are as useful garden plants. The European Privet is a tall, round-topped shrub; the leaves are still as green as at midsummer and make the best possible background for the large clusters of shining black fruits. There is a form of this plant with yellow-green fruit but this is less desirable than the black-fruited form. The European Privet is one of the hardiest of plants; it grows quickly into a large, round-topped shrub; it is not particular about soil; it bears the shears well, and so can be used in hedges or cut into fantastic shapes. Europe has made comparatively few valuable contributions from its native flora to the gardens of this country and this Privet is one of the best of them.

The handsomest semi-evergreen shrub, perhaps, now in good condition in the Arboretum is an *Evonymus* which is to be seen in the *Evonymus* Group on the right-hand side of the Meadow Road. It is a broad shrub, ten or twelve feet high, with bright green leaves which will not fall for several weeks. The fruit is small, sparingly produced, and hardly noticeable. This remarkable plant is called *Evonymus Hamiltonianus*, var. *semipersistens*, and nothing is known of its origin although it is not improbable that it is a native of some part of China, and it is possibly a distinct species rather than a variety of another plant.

Some of the Honeysuckles might find a place in an autumn garden for the leaves of several species are still perfectly green. The best known of these are two Chinese species which have been cultivated in this country for at least half a century, *Lonicera fragrantissima* and *Lonicera Standishii*. These are large hardy shrubs and produce their fragrant flowers in early spring before the leaves appear. The leaves of a few other species are still untouched by autumn. The most conspicuous of these are *Lonicera xylosteum* from Europe and northern Asia, *Lonicera*

tibetica from western China and Thibet, a low plant with slender spreading branches, and *Lonicera Ledebourii* from California.

Nearly all the plants of the Elaeagnus Family retain their leaves until late in the autumn, but the only one in the collection which is still as green as at midsummer is the Sea Buckthorn, *Hippophae rhamnoides*, a widely distributed shrub or small tree of Europe and central Asia. The male and female flowers are produced by different individuals and the female plant is attractive when the branches are covered with orange-colored persistent fruits. Tall treelike plants of the Sea Buckthorn can be found with the other plants of this Family on the left-hand side of Bussey Hill Road just above the Lilac Collection.

Several European yellow-flowered plants of the Pea Family are now conspicuous from the bright green color of their leaves. Some of the most beautiful autumn plants among them are *Genista germanica*, *Genista pilosa*, *Genista tinctoria*, *Genista elata*, *Cytisus nigricans*, and *Cytisus capitatus*. These are all small low shrubs well suited for small gardens. They can be found in the Shrub Collection. Another yellow-flowered plant of this Family, *Coronilla Emurus*, of southeastern Europe, grows to a larger size but it is equally green in the first week of November. There are good specimens of this rather tender shrub on the right-hand side of Azalea Path.

The leaves of few American plants retain their summer color until November. An exception, however, is *Leucothoe racemosa* from the southern Appalachian Mountains which can be seen in the Shrub Collection. A very different plant but one still as green is the Chinese Matrimony Vine, *Lycium chinense*. This has long, wand-like, arching or prostrate stems which with a little support can be made vine-like and used to cover trellises. It is a useful plant for draping walls and when planted as a shrub in masses it soon makes an impenetrable barrier. The scarlet shining fruits which are abundantly strung along the branches add greatly to the autumn beauty of this hardy plant. It has been freely used to cover the boundary walls of the Arboretum and it can also be seen in the Shrub Collection.

In the group of Barberries on Hickory Path and in the Shrub Collection is a plant which is still but little known in American gardens. This is *Berberis Neubertii*, a hybrid between the common Barberry, *Berberis vulgaris*, and the evergreen *Berberis* or *Mahonia Aquifolium*. It is a moderate-sized, broad-topped shrub with large dark green leaves which remain on the branches with little change of color through November. This plant does not bloom freely and rarely produces fruit, but it is one of the hardiest and handsomest of the shrubs with semi-persistent foliage which have been introduced into the Arboretum.

The leaves of a few vines are still almost as green as in summer and promise to remain green for sometime longer. The best known of these, perhaps, is a Japanese Honeysuckle, a form of *Lonicera japonica*, which is usually known in gardens as Hall's Honeysuckle. In the middle and southern states this vigorous plant has become perfectly naturalized, often crowding out the native plants, and retains its foliage during the winter. Here the leaves are killed by severe cold. As a flowering plant, too, this is one of the handsomest of the Vine Honeysuckles which are hardy in this climate.

The leaves of the two Akebias, *Akebia quinquefolia* and *Akebia lobata*, are still fresh and green, and these slender and graceful vines deserve a place in every autumn garden. The small purple flowers do not make much show, and the edible fruit, which is largely consumed in Japan, is rarely produced in this climate. Large plants can be seen on the trellis at the eastern end of the Shrub Collection.

Clematis paniculata, one of the handsomest of the late summer-flowering species and now one of the most popular hardy plants in the United States, is still covered with leaves as green as they were in July. Another vine growing on the trellis near the Akebias is now conspicuous with bright green leaves. This is a Japanese Moonseed, *Cocculus Thunbergii*.

A few shrubs are still brilliant in their autumn dress and the leaves of others are only beginning to turn. The most important of these last is *Viburnum Canbyi*, a native of eastern Pennsylvania and of Delaware. This is the last of the Viburnums to flower; and its bright blue fruits do not ripen until October. Plants of this handsome shrub in the Arboretum are now fully ten feet high and from ten to twelve feet in diameter. The large leaves are only just beginning to turn from dark green to the color of old leather and will be in good condition for two or three weeks longer. There are several large plants of this Viburnum on the right-hand side of the entrance to the Administration Building, and there are others on the right-hand side of both the Meadow and the Bussey Hill Roads.

The leaves of two Currants in the Shrub Collection are just turning scarlet. These are *Ribes curvatum* and the Chinese form of *Ribes fasciculatum*. *Ribes curvatum* is a little known plant found a few years ago in the neighborhood of Stone Mountain in central Georgia. It has white flowers gracefully drooping on long stems, and in cultivation has proved to be one of the most attractive in the large collection of these plants in the Arboretum. The beauty of the Chinese Currant at this season is increased by the bright red fruits which are still on the branches. This handsome Currant is the only one of its genus in the collection with fruit which ripens in the autumn.

A few other shrubs are still worthy of notice for their autumn coloring. The most conspicuous among these now perhaps is *Cornus sanguinea*, with leaves the color of old Spanish leather. This is a large shrub from Europe which has been able to adapt itself perfectly to our climate where it flowers freely and produces large quantities of dark-colored fruit which, however, has now disappeared. A broad massive specimen will be found on the right-hand side of the Bussey Hill Road just beyond its junction with the Meadow Road and on the upper margin of the Cornel Group.

Other shrubs with still highly colored foliage are the Japanese *Viburnum tomentosum* with leaves of dark reddish brown, and *Lyonia* or *Andromeda ligustrina*, with bright scarlet leaves. This handsome native plant has been generally planted among the shrubs along some of the drives in the Arboretum and it can be found in the Shrub Collection.

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The climate of New England is usually considered unfavorable to the successful cultivation of conifers. As compared with New Zealand, northern Italy, Ireland, and the region adjacent to Puget Sound, New England is certainly a poor country for these trees. There are worse regions for conifers, however, like some of the middle western states and Texas, and two of the handsomest trees of this class in the world grow at their best in New England, the White Pine, *Pinus Strobus*, and the Hemlock, *Tsuga canadensis*. No region need be poor in conifers where these two trees flourish. The conifers of Europe do not find congenial conditions here, although those from the northern and central parts of the continent, like the Norway Spruce, and the Scotch, Austrian and Swiss Pines, are hardy although generally short-lived. The Himalayan species, with the exception of *Pinus excelsa* which is never satisfactory here, are not hardy. None of the conifers of Mexico or South America, Australia or Tasmania, can be grown in the northern states in which the species of southern China and Japan are not hardy. Unfortunately very few of the conifers of western North America succeed in the eastern states, as these are the noblest of the trees of this class. The exceptions are the western White Pine, *Pinus monticola*, a tree which bears a general resemblance to our eastern White Pine and which is distributed from the sea-level on Vancouver Island up to high altitudes on the California Sierra Nevada and the mountains of Idaho. The Sugar Pine of the California Sierras, *Pinus Lambertiana*, the greatest of all Pine trees, gives little promise here of ever becoming a large or valuable tree. This is also true of Jeffrey's Pine, *Pinus ponderosa* var. *Jeffreyi*, which can be seen in its greatest beauty on the eastern slopes of the Sierra Nevada. The western Mountain Hemlock, *Tsuga Mertensiana*, or as it is often called *Pattoniana*, *Abies amabilis*, the lovely Fir of the Cascade Range, the Incense Cedar of the Sierra Nevada, *Libocedrus decurrens*, and the Fir of the northwest coast, *Abies grandis*, and the Red Cedar, *Thuya plicata* or *gigantea*, are hardy in sheltered positions in the Arboretum but do not promise to be very long-lived here or to add much permanent beauty to our plantations. All the conifers of the northeastern part of this continent are, of course, hardy here but, with the exception of the White Pine, the Hemlock, the Red or Norway Pine, *Pinus resinosa*, the White Spruce, *Picea canadensis*, the Arbor Vitæ, *Thuya occidentalis*, the Red Cedar, *Juniperus virginiana*, and the Larch, *Larix americana*, none of these are of much ornamental value.

On the slopes of the Blue Ridge in South Carolina, about the headwaters of the Savannah River, there is a conifer which seems destined to play an important part in the decoration of our northern parks and gardens. This is the so-called Carolina Hemlock, *Tsuga caroliniana*, which although a smaller tree than our northern Hemlock is even more graceful in the droop of its slender branches. This is a tree from which much can

be expected. It is very hardy in the Arboretum where it has been growing for thirty years. The largest specimen in the collection will be found in the rear of the Laurels by the side of a walk along the northern base of Hemlock Hill. There are also a number of specimens in the mixed plantation of conifers near the corner of Centre and Walter Streets.

All the conifers of the Rocky Mountains are hardy in the Arboretum. The most promising of them are the Douglas Spruce, *Pseudotsuga mucronata*, and the Engelmann Spruce, *Picea Engelmannii*. The Douglas Spruce is one of the great trees of the world; it grows to an enormous size; it produces valuable timber, the Oregon Pine of commerce, and it is widely distributed from the shore of the Pacific Ocean over nearly all the mountain ranges of the west as far east as Colorado. A valuable lesson has been learned from this tree. For individuals raised from seeds gathered near the Pacific coast had not been hardy in New England, while plants from Colorado seed are perfectly hardy here, grow rapidly, and promise to become useful ornamental and timber trees. This experience with the Douglas Spruce shows in a striking manner the importance of a careful selection of the seeds of trees, and that in the case of widely distributed trees, like many conifers, the seeds should be gathered from regions most similar in climate to the region where the trees raised from the seeds are to grow. Such careful selection of seeds has been too generally neglected. When, however, its importance is understood it is possible that the area over which many trees can be successfully cultivated will be greatly extended.

Engelmann's Spruce in Colorado forms pure forests up to altitudes of 11,000 or 12,000 feet and ranges north into Alberta. It is a narrow pyramidal tree with gray-green foliage and cinnamon-red bark. It is too soon to speak of the value of this tree as a permanent addition to our plantations for it is only fifty years since it was discovered. The trees in the Pinetum of the Arboretum, which are believed to be the best in cultivation, are thirty-two years old. The Colorado White Fir, *Abies concolor*, is a fast-growing and hardy tree which of all the silver Firs appears to best suited to New England. There are a number of specimens in the Pinetum about thirty years old but, like other silver Firs, they will probably grow less attractive as they grow older. The California form of *Abies concolor*, the *Abies Lowiana* of some collections, is hardy here but is a less desirable tree in this climate than the Colorado form. The best known of the Colorado conifers is the so-called Blue Spruce, the *Picea pungens* of most collections. This has been largely propagated in European and American nurseries and very generally planted. As this tree grows in Colorado, where it is not common, it becomes long before it attains its full size thin, ragged and unsightly. In cultivation the young plants are handsome and symmetrical, but as the cultivated plants grow older they lose their lower branches and much of their beauty, and it is probable that this tree will not much longer retain its popularity. The Rocky Mountain form of the western Yellow Pine, *Pinus ponderosa* var. *scopulorum*, and the Rocky Mountain White Pine, *Pinus flexilis*, can be

seen in the Pinetum but these are trees which grow slowly and probably will never be large or important trees in this climate.

The conifers of central and northern Japan usually do well in New England although only time can tell whether they will ever reach old age here. One of the Silver Firs, *Abies brachyphylla*, grows particularly well in the Arboretum and, next to *Abies concolor*, is one of the most promising of the Silver Firs which have been planted in New England. The other Japanese Firs are hardy here but none of them seem likely to attain any great size or age. Several of the Japanese Spruces grow well, and of *Picea Alcockiana*, *Picea bicolor*, and *Picea Glenhii*, better specimens can be seen in New England than in Europe.

The Japanese Arbor Vitae, *Thuya Standishii*, is not a large tree but it is perfectly at home in the Arboretum, as is the curious Umbrella Pine, *Sciadopitys verticillata*, and the Mountain Hemlock, *Tsuga diversifolia*. The true Pines of Japan, *Pinus Thunbergii*, *Pinus densiflora*, the eastern Asiatic representative of the so-called Scotch Pine of Europe and Siberia, *Pinus parviflora* and *Pinus pentaphylla*, are all well established in the Arboretum and produce cones here every year. The different forms of *Retinospora*, or *Chamaecyparis*, can also be seen in the Arboretum where there is a large collection of these plants; they sometimes suffer from our dry summers.

Of the continental conifers of eastern Asia the most interesting in the Arboretum are the Korean and Manchurian White Pine, *Pinus koraiensis*, one of the most valuable timber trees of eastern Asia, and the curious Lacebark Pine of China, *Pinus Bungeana*. This is a tree often shrubby in habit with thin foliage and chiefly remarkable for the snow-white color of the trunk and branches of old trees, a condition which none of the specimens in this country are yet old enough to show.

Two conifers from the Balkan Mountains are hardy in the Arboretum and produce their cones annually. These are a Spruce, *Picea omorika*, and a White Pine, *Pinus peuke*. *Picea omorika*, although it forms great forests on the mountains of southeastern Europe, has been known for a few years only to botanists and some of the oldest plants in cultivation are in the Arboretum where they form narrow, rather compact pyramids and, growing rapidly, promise to be valuable ornamental trees. Its nearest relative is the Spruce of the northwest coast, *Picea sitchensis*, which is not hardy here.

Of the Firs of southeastern Europe and Asia Minor *Abies cilicica* and *Abies cephalonica* are perhaps of the most promise in this climate where they are perfectly hardy. The former is a native of the Cilician Taurus where it grows at a high elevation above the sea-level with the Cedar of Lebanon, here in its most northern and coldest station. A few years ago the Arboretum was fortunate in securing the seeds of the Cedar from this region and the trees raised from these seeds are now well established and promise to be successful here, while plants of this tree derived from Palestine have proved unable to bear the New England climate.

The important conifers of the Caucasus, *Abies Nordmanniana* and *Picea orientalis*, are hardy here and the latter is a valuable ornamental tree not unlike in general appearance the Red Spruce, *Picea rubra*, of northeastern North America which grows very slowly and does not take kindly to cultivation. The Spruce, *Picea Schrenkiana*, which covers with a stunted forest the dry slopes of the mountains of central Asia, is hardy and healthy in the Arboretum, but it will probably never become an important ornamental tree. A more desirable tree here is the Spruce of central Siberia, *Picea obovata*, which is well established in the Arboretum where it already produces its cones.

All the Larches now known, with the exception of the Himalayan species, are growing in the Arboretum, including an interesting hybrid between the European and the Japanese species lately produced in Scotland. As an ornamental tree the eastern North American *Larix americana* is the most picturesque of all the Larches. The Japanese *Larix Kaempferi* or *leptolepis* grows the most rapidly. The largest of the genus is the western American *Larix occidentalis*, and the least known are *Larix chinensis* and *Larix Potanini*. *Larix siberica* from eastern Siberia and the Altai and *Larix dahurica* from eastern Siberia are still little known in this country. The Larches are at the western end of the Pinetum just above the Walter Street entrance. Near them is a group of Larch-like trees, *Pseudolarix Kaempferi*, a Chinese tree with the deciduous leaves of a true Larch and erect cones which fall apart when ripe like those of the Cedars. This interesting, beautiful and hardy tree which for many years was only known in temple gardens, has now been found growing abundantly on the mountains near Ningpo in southern China.

It is impossible in the space of one of these bulletins to do more than briefly mention the most important conifers in the Arboretum, where there are now growing all the species with their numerous varieties which it is possible to keep alive here. The world has been pretty thoroughly explored for coniferous plants and the only place left where new trees of this class are likely to occur is western China. On the high mountains which form the Chinese-Tibetan boundary in addition to Firs, Hemlocks and Larches there appear to be more species of Spruce than in all the rest of the world. Seeds of all, or nearly all, of these trees have been obtained by the Arboretum, and the seedlings raised from them are now growing here and, through the agency of the Arboretum, in several American and European gardens.

The Taxus Family, Taxaceae, is now usually separated from the Coniferae although the Yews and their allies are generally spoken of as conifers. The most important of this group is, of course, *Ginkgo biloba*, the last survivor of an ancient race once widespread over the northern hemisphere and now known only from the plants cultivated in Chinese and Japanese gardens and their descendants. This tree is very hardy; it grows rapidly; it lives to a great age; and at maturity it becomes very

picturesque with its wide-spreading and drooping branches. It should be planted in this country more generally than it has been for it readily adapts itself to the severe climate of New England.

One of the most interesting genera in this Family is *Torreya*, or as it is sometimes called Tumion, named in honor of a Nestor of North American botanists, and it is fortunate that its Japanese representative, *Torreya nucifera*, one of the handsomest evergreen trees in Japan, is hardy in this climate. A group of these plants is growing among the Laurels at the base of Hemlock Hill. The type of this genus, *Torreya taxifolia*, is a native of western Florida and one of the rarest of North American trees. There is a plant of this species near the top of Hemlock Hill where in a very sheltered position it has been growing for a number of years with several other conifers of doubtful hardiness.

The European Yew, *Taxus baccata*, is generally not hardy in New England, although there are a few varieties of this tree growing in the Arboretum. It is fortunate, therefore, that the Japanese and Chinese Yew, *Taxus cuspidata*, is entirely hardy here. The foliage of this tree is rather lighter in color than that of the European Yew; it grows more rapidly, and there appears no reason why it should not reach a large size and attain a great age in this country. There is a semiprostrate form with darker-colored leaves and long and semierect branches which spread into large masses. This is the variety *brevifolia* of American gardens. Of all the contributions, and they are many and important, which Japan has made to the gardens of New England these Yews are probably the most valuable.

These bulletins will now be discontinued until the spring.

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The Arboretum will be grateful for any publicity given these Bulletins.

No. 18

ARNOLD ARBORETUM

HARVARD UNIVERSITY

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OF

POPULAR INFORMATION



JAMAICA PLAIN, MASS.

APRIL 18, 1912

BULLETIN NO. 18.

It might have been expected that the last year with its exceptionally dry summer and remarkably cold winter would have damaged many plants in the Arboretum, but on the whole the collections are in unusually good condition and as yet show little effect of the severe climatic changes of the winter. The conifers are all uninjured with the exception of one or two small plants of the Hemlock of the northwest coast, *Tsuga heterophylla*, planted near the top of Hemlock Hill. This is a tree of very doubtful hardiness here and it is satisfactory that the second specimen is untouched. The broad-leaved evergreens are in unusually good condition for this season of the year when they too often look brown and shabby. A few small Rhododendrons on trial for their hardiness have suffered, but generally the Rhododendrons are in good condition and promise abundant bloom. The Laurels (*Kalmia latifolia*), are uninjured by heat, drought or cold and give promise of such masses of flowers as have not before been seen on these plants in the Arboretum.

The influence of the weather on the plants raised from seeds collected in western China has been watched with interest as a number of them were planted last year in exposed positions that their hardiness here might be tested. The winter has shown that a large number of Chinese trees and shrubs new to our plantations can probably be successfully cultivated in Massachusetts, and of course in all the regions south of Massachusetts. The following are some of the most important of these trees: *Davidia involucrata* should perhaps be mentioned first. It is a medium sized tree related to our Flowering Dogwood, but with one large floral bract in place of the four smaller bracts of the American tree. *Davidia* is described as one of the most beautiful of all the flowering trees of temperate regions and its introduction a few years ago into cultivation through French missionaries was a matter of great horticultural interest. It has lived for several years in the Arboretum and has flowered twice in Europe. Of especial interest is *Cladrastis sinensis*, introduced by Wilson, as it adds another to the list of genera represented in the eastern United States and China. The American *Cladrastis*, better known as *Virgilia*, is one of the rarest and most beautiful of the trees of the United States. Unfortunately the Chinese species promises to be of less value as an ornamental tree. The flowers, which are sometimes faintly tinged with pink, are smaller than those of its American relative and are borne in erect not drooping clusters. The leaflets are smaller and the bark is of a darker color. The two new *Catalpas* from western China, *C. Fargessii* and *C. Duclouxii*, are both uninjured. In *Phellodendron chinense* there is an important addition to the eastern Asiatic genus *Phellodendron*, represented before in the Arboretum by three species. It is good news that *Staphylea holocarpa* has come through the winter in good condition. This is a tree twenty to twenty-five feet tall, producing in May before the leaves appear pendulous racemes of fragrant flowers varying in color from white to rosy lilac. Mr. Wilson speaks of it as the handsomest of

its genus, and one of the most beautiful of the small flowering trees of western China. The different forms of the so-called European Walnut (*Juglans regia*), introduced by Wilson, and the distinct *J. cathayensis*, a tree with splendid foliage and nuts resembling those of the American Bitternut, are uninjured by the cold. *Populus lasiocarpa*, which has lived in the Arboretum uninjured during the past two years, adds a very remarkable and handsome species to the large group of these trees which can be cultivated here. A still more beautiful species brought back by Wilson on his last journey and still unnamed has passed the winter without injury. Even the Liquidambar of central China, *L. formosana*, is uninjured and may prove hardier here than the native species which suffers in eastern Massachusetts except in favorable positions.

The greatest of all the Hazels, *Corylus chinensis*, judging by the plants at this time, gives promise of becoming an important addition to the ornamental trees which can be cultivated here. With an average height of from sixty to eighty feet and a girth of trunk of from eight to ten feet, in favorable situations on the mountains of Hupeh it attains a height of more than a hundred feet with a trunk five feet in diameter. There is much interest in the various forms of Cherry raised from seeds sent home by Mr. Wilson, who found an unexpectedly large number of species in several of the groups of the genus *Prunus* to which the Cherries belong. They are nearly all quite new to science and of course have not been found before in gardens. Thirty of these new species or varieties have passed through the winter uninjured, and only two species, which will probably not live here, have suffered. Among these species are a number of great beauty and this group perhaps is the most interesting of the deciduous-leaved trees obtained by Mr. Wilson during his first journey. The Hemlock of western China, *Tsuga yunnanensis*, has now lived for two years in the Arboretum. This is one of the largest and most widely distributed of the conifers of China. The fact that it grows with the Spruces and Firs which cover the mountains of the Tibetan frontier indicates that these trees may also be hardy in this climate. The introduction of these conifers was the object of Mr. Wilson's last journey to China, and they are now growing in the Arboretum and in many public and private collections.

It can be said that generally the new Chinese species of Oak, Beech, Birch, Willow, Poplar, Pear, Maple and Ash, besides some of the less well known genera like *Idesia*, *Euptelea*, *Poliothyrsus* and *Eucommia*, judging by the experience of the past year, are likely to succeed here and it is probably reasonable to hope that not less than seventy-five new species of trees will be added to our plantations by Mr. Wilson's first journey to China. In another issue something will be said of the condition of some of the new Chinese shrubs.

There are already many flowers to be seen in the Arboretum. The Elms, and the Red Maple, the Poplars and some of the Hazels are in flower. The flowers of the Silver Maple are already falling. Many of the Alders are now covered with their delicate flowers. One of the most interesting of these is the Japanese *Alnus tinctoria*. This is a medium sized shapely tree with smooth pale bark and large dark green leaves. Two specimens can be seen on the right-hand side of the Meadow Road close to the walk and in front of the Linden Group. They were raised

from seeds brought from Japan by Professor Sargent in 1892 and have grown more rapidly and to a larger size than any of the plants of that collection. This is a good time, too, to examine the Willows as many of the shrubby species are in flower on the walk which starts from a path opposite the Administration Building and follows along the eastern boundary of the North Meadow.

The first plant to bloom in the Shrub Collection is *Daphne Mezereum* where the white flowered form has been flowering for more than a week. This small shrub, of which there are several forms in cultivation, is a native of the mountains of Europe and Western Asia. It is valuable for its very early fragrant flowers, appearing with or before the leaves, and for its showy scarlet fruits.

On the right-hand side of the Bussey Hill Road, opposite the end of the Lilac Group, are large masses of two native shrubs. The first, the Spice Bush (*Benzoin aestivale*), is a common inhabitant of northern swamp borders. It is a tall shrub with slender branches on which the small yellow flowers are now opening. The male and female flowers are found on different individuals, so that only some of the plants bear the small, bright scarlet, shining fruits which are so attractive in the autumn. The leaves, which are fragrant like those of its relative the Sassafras, are uninjured by insects and turn bright yellow before falling. This is one of the common shrubs which should be better known by gardeners. Just above the Spice Bushes is a group of the Leatherwood (*Dirca Palustris*), which in the perfection of its specimens is one of the most successful groups in the Arboretum. The Leatherwood is valuable for its small but very early and abundant yellow flowers which appear before the leaves and will soon be fully open. It owes its common name to the toughness of the bark of the branches. The geographical distribution of the genus is unusual, as of its two species one is widely distributed in the eastern United States and the other is found only in California.

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The Arboretum will be grateful for any publicity given these Bulletins.

No. 19

ARNOLD ARBORETUM

HARVARD UNIVERSITY

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JAMAICA PLAIN, MASS.

APRIL 25, 1912

BULLETIN NO. 19.

In the last issue of these bulletins something was said of the effects of the winter on a few of the new Chinese trees in the Arboretum. The number of new Chinese shrubs which promise to be hardy in this climate is naturally much larger than the number of trees. We can speak, however, only of a few of these now. Of Lilacs Wilson found eleven species in China. Nearly all of these were discovered by him and most of them are now growing in the Arboretum where three species have been sufficiently tested to show that they will be hardy here. These are *Syringa pinnatifolia*, *S. Komarowii* and *S. Wilsonii*. The flowers and flower-clusters of the first are small and not conspicuous, but the deeply divided leaves are unusual among Lilacs and form the chief interest in this plant. The others are large shrubs related to *S. villosa* with handsome foliage and flowers. More interesting, although not yet fully tested for hardiness, are *S. reflexa*, with long pendulous flower-clusters, thus differing from all the other known Lilacs, and *S. Sargentiana* with long acuminate leaves and shorter nodding not pendulous flower-clusters.

The genus *Cotoneaster*, which is valued chiefly for its black or red, often long-persistent fruits, has been poorly represented in our gardens as few of the species previously known have proved hardy here. Wilson, however, found an unexpectedly large number of new species of *Cotoneaster* in western China and at least a dozen of these have passed through the winter without injury and promise to become valuable garden plants here. Among these may be mentioned *C. Dielsiana*, with weeping whip-like branches and small red fruits persistent late into the winter, *C. divaricata* with dark red fruits, *C. foveolata* with large leaves which turn in the autumn to brilliant shades of orange and crimson and black fruit, *C. moupinensis* also with black fruit, a plant remarkable in the brilliant colors the leaves assume here in the autumn, and *C. hupehensis*, a strong-growing, shrubby black-fruited species with graceful spreading branches, ornamental white flowers and crimson globose fruit.

Among the new *Spiræas* introduced by Wilson are three species which are now known to be perfectly hardy and to be among the most ornamental of all the numerous species and hybrids of this genus. These are *S. Henryi*, *S. Wilsonii*, and *S. Veitchii*.

The Chinese Witch Hazel, *Hamamelis mollis*, a common shrub of the central provinces, has now lived unhurt in the Arboretum for two years. It is one of the late winter or early spring-flowering species and its flowers are said to be more beautiful than those of the other Witch Hazels. Several of the Chinese Hydrangeas are uninjured by the winter. Among these may be mentioned *H. xanthourea* and its several varieties, all handsome shrubs with large corymbs of flowers. In *Exochorda Giraldui* New England gardens have a new and perfectly hardy plant of first-rate importance. It grows to a height of twelve feet or more and produces larger and handsomer flowers than the well-known Pearl Bush of gardens, *Exochorda grandiflora*.

Of the beautiful genus *Abelia* we have before been able to cultivate only the hybrid *A. grandiflora*, so it is particularly gratifying that the large-flowered, strong-growing *A. Engleriana* proves to be hardy here. It is of interest, too, that the new monotypic genus *Kolkwitzia* flourishes here. It is a shrub from four to six feet high with large terminal pan-

icles of flowers followed by crimson hairy fruits, and is related to *Abelia* and *Lonicera*. Another beautiful plant of this family, *Dipelta floribunda*, of a genus new to cultivation, with large and showy Weigelia-like flowers, can also be numbered among the hardy Chinese plants.

Of Wilson's numerous Honeysuckles which are flourishing in the Arboretum we can only mention now *Lonicera prostrata*, which promises to be a useful plant for covering rocky slopes and banks. It is very hardy and free-growing, with prostrate stems, small oval bluish-green leaves small white flowers turning yellow when fading, and orange-red fruits; *L. Henryi*, a vigorous climbing plant which has preserved its large dark green leaves through the winter, and *L. tragophylla*, which in habit and general appearance resembles the Woodbine of Europe although the flowers are golden yellow. An important addition to very early-flowering shrubs is *Corylopsis Veitchiana*, with short pendulous racemes of primrose-yellow fragrant flowers produced before the leaves unfold. A majority of the large collection of Chinese Brambles are uninjured, especially those showy species with nearly white stems, like *Rubus lasiostylus* and *R. coreanus*.

Of the Grape Family at least six new species have come through the winter without injury. Of these perhaps the most interesting is *Ampelopsis megalophylla* with canes from twenty to thirty feet long and large divided leaves often more than three feet in diameter. The Barberries have probably suffered more from the winter than any of the other deciduous-leaved shrubs planted in exposed situations, but many species and varieties of Roses, *Deutzia*, *Philadelphus*, *Viburnum* and *Ligustrum* are in excellent condition and promise to make important additions to these groups in northern gardens.

Near the Administration Building the Asiatic Magnolias, which flower before the appearance of the leaves, are beginning to open their flowers; indeed the fragrant flowers of the shrubby *Magnolia stellata* and its pink-flowered form have been in bloom for a week. This is a perfectly hardy, usually free-flowering and very desirable shrub. The small flowers of *Magnolia kobus* from central Japan and its larger-flowered northern variety (var. *borealis*) are open. This northern variety is a large, hardy, fast-growing tree of good habit and handsome foliage, but it has never flowered freely here and the petals hang down in an unattractive way soon after the flowers open. It is a much less valuable ornamental plant than the Chinese *M. conspicua*, often called the Yulan Magnolia, which is one of the most beautiful of all early-flowering trees, although unfortunately the flowers are frequently touched by late frost or injured by storms. That the flowers may be seen to the greatest advantage the tree should be planted in front of evergreens which would also protect the flowers from frost. The hybrids, which have been mostly raised in France by crossing *M. conspicua* with the shrubby, purple-flowered *M. denudata* (or *purpurea*), flower rather later than the species and are therefore less liable to suffer from frost. These hybrids have flowers more or less tinged or striped with purple or rose color and the best known are *M. Soulangeana*, *M. Alexandrina*, *M. Lennei*, *M. Norbertiana* and *M. speciosa*.

The Forsythias are fast opening their flowers. This genus has given to gardens some of the most beautiful and most generally satisfactory of all hardy shrubs. The species are all Chinese with the exception of *F. europaea* which was discovered in Albania a few years ago. As we are learning every year, hybrids are often more desirable garden plants

than the species from which they originate, and certainly the handsomest of the Forsythias in flower is a hybrid between *F. suspensa*, var. *Fortunei* and *F. viridissima*, called *F. intermedia*. Of this hybrid there are a number of forms differing in habit and in the color of the flowers, showing opportunity for still further variation and improvement. Of the species and varieties var. *Fortunei* is now the most generally used and the most vigorous and desirable garden plant, although *F. suspensa*, with its long slender drooping branches is best suited for draping high walls or steep banks. The European species is of much less value as a garden plant, and *F. viridissima* the first species cultivated in Europe and America and the latest of all to flower, is of comparatively little ornamental value.

The Buffalo Berry (*Shepherdia argentea*) is in flower in the Oleaster Group on the left-hand side of Bussey Hill Road just above the Lilacs. The Buffalo Berry is a shrub or small tree with handsome silvery leaves, minute, clustered, axillary, precocious flowers, and small handsome crimson or yellow subacid fruits. It is a common inhabitant of the borders of streams from Saskatchewan to the Rocky Mountains as far south as New Mexico. In recent years much attention has been paid to it as a fruit plant in the dry cold interior parts of the continent.

The earliest of the Peaches, *Prunus (Persica) Davidiana*, is in flower, although the plants in the Arboretum are blooming sparingly this year. This is a native of the mountains of northern China, and some writers have considered it the wild type of the cultivated Peach. There are pink and white-flowered varieties. This tree flowers, however, so early that the flowers are too often destroyed by frost and therefore it is not of great importance as a garden plant here.

The earliest of the Cherries to flower, *Prunus tomentosa*, is also from northern China, and will be in bloom within a week. This is a broad vigorous shrub of excellent habit which every spring is covered with large flowers, the white petals more or less tinged with red toward the base. The small, bright red, slightly hairy fruits are of good flavor. This interesting shrub was raised from seeds sent to the Arboretum from Peking in 1882 and is now somewhat cultivated for its fruit in Alberta, Dakota and in other cold dry interior regions of the continent where other Cherries are not hardy. It should be much better known than it is in northern gardens. Very large specimens can be seen along the Boston Parkway between Perkins Street in Jamaica Plain and Forest Hills, and there are small plants on the right-hand side of Forest Hills Road, entering from the Forest Hills Gate. A number of interesting forms of this plant discovered by Wilson in northern China have recently been described.

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JAMAICA PLAIN, MASS.

MAY 1, 1912

BULLETIN NO. 20.

The most interesting event, perhaps, in the Arboretum this week is the flowering of several Japanese Cherries, which may be seen on the left hand side of Forest Hill Road from its junction with the Meadow Road to the Forest Hill gate. The first of the Japanese Cherries to flower is *Prunus Sargentii*. This is a tall tree in the native forests of the Northern Island where it is valued as a timber tree. There are six specimens of different sizes on the Forest Hill Road, and they are now covered with clusters of large pink or rose-colored single flowers, for the color of the flowers of this tree vary considerably on different individuals. The small black fruits which ripen in June are almost hidden by the large dark green leaves which in the autumn turn to shades of orange and red; the smooth, shining, reddish bark adds to the beauty of this tree. Travellers who have seen Cherry blossoms in many lands declare that *Prunus Sargentii* as it now appears in the Arboretum surpasses in beauty all other Cherry-trees. Whether this is an exaggeration or not it is certainly a tree of first rate importance for New England; and its hardiness, rapid growth, large size, the abundance of its flowers even on small plants, and its handsome foliage make it the most valuable deciduous leaved tree we have yet obtained from Japan. The trees in the Arboretum produce large crops of seeds and these germinate readily so that there is no reason why *Prunus Sargentii* should not become a common tree if nurserymen will recognize its value and make a business of making it known to the public.

The better known *Prunus pendula* flowers a few days later. This tree is remarkable for its long, slender, pendulous branches which before the leaves expand are covered with small pink flowers. *P. pendula*, which does not appear to be common in a wild state in Japan, is often planted in Japanese gardens in which it sometimes grows to a large size. It was brought to the United States many years ago, and specimens from twenty to thirty feet high can be seen in the neighborhood of Boston. By nurserymen it has usually been propagated by grafting on tall stems of the common Cherry, with the result that the trees look unnatural and are rarely long-lived. Plants produced by grafting at the ground level grow to a larger size, live longer, and when in flower look like fountains of pink mist. It has been shown at the Arboretum that the drooping habit of the branches is reproduced in seedlings, and as this Cherry bears seeds freely, seedling plants will, it is to be hoped, become more common.

A plant with even more beautiful and more abundant flowers than *Prunus pendula* is *Prunus subhirtella*, or as it is now labelled in the Arboretum, *P. pendula ascendens*, a small tree, or as it has grown here a large shrub, from central Japan, and now known through Wilson's collections to occur also in western China. It is perfectly hardy and flowers freely every year. Introduced into the Arboretum twenty years ago, and from here sent to Europe, it is surprising that this handsome plant has remained so little known in gardens.

Prunus triloba can be seen in flower near *P. tomentosa* just below the entrance to the Shrub Collection at the Forest Hill gate. It is a shrub with bright clear pink flowers which are about an inch in diameter and appear before the leaves. The double flowered form of this shrub (var. *multiplex*) is a favorite garden plant in China whence forty or fifty years ago it was introduced into Europe and the United States where it is often

cultivated. The much more beautiful single-flowered plant grows on the mountains near Peking and appears to have been cultivated for the first time in the Arboretum to which seeds were sent from China in 1882. Although perfectly hardy *P. triloba* is not a particularly vigorous plant. It well deserves a place, however, in every garden for the charming color of the flowers.

The Plum-trees in the group next to the Cherries and at the principal entrance to the Shrub Collection from the Meadow Road are beginning to open their flower-buds. The earliest is the Canada Plum (*Prunus nigra*). This is the most northern of the American Plums, being distributed from Newfoundland to the shores of the Strait of Mackinaw and southward to the northern borders of the United States. It is a small tree with rough dark bark, rather erect, ridged, spiny branches, and flowers slightly tinged with pink and becoming rose-colored in fading. This is not one of the handsomest of the American Plum-trees, but it is valuable on account of its hardiness, the early appearance of the flowers, and the early ripening of the fruit. Several selected forms are grown by pomologists. The flowers of *P. nigra* will soon be followed by those of the Chinese *P. triflora*. This is a common fruit tree in China and Japan, and from it or from some of its varieties the so-called Japanese plums, now so popular in the United States, have been derived. The plants in the Arboretum were obtained from seed brought in 1892 by Professor Sargent from Japan. With *P. triflora* will probably flower one of the Siberian Apricots, *P. dasycarpa*. In the Arboretum it has grown into a large shrub with wide-spreading branches. This plant is chiefly interesting on account of the dark purple or black color of the fruits which, however, have little value in comparison with those of the common Apricot.

The Shad-bushes (*Amelanchier*) are just opening their flower-buds and it is a delightful time in the Arboretum when they are in bloom for they have been planted freely in the borders and along the margins of the woods, and some of these plants have grown to a large size. Two species are native in the Arboretum, *A. canadensis*, which grows in woodlands and often becomes a tree of considerable size; this species can always be recognized in early spring by the purple color of the unfolding leaves; and *A. obovalis*, which is an inhabitant of low moist soil and more shrubby in habit, with gray unfolding leaves covered with a thick felt. There are good sized trees of the former at the base of the wooded slope on the right hand side of the Forest Hill Road and in the rear of the Apple Group, and there is a large plant of *A. obovalis* on the border of the North Meadow. It is this species which has been generally planted in the Arboretum.

Few of the forest trees of Europe really succeed in eastern North America, but in the half dozen exceptions to this rule the Norway Maple (*Acer platanoides*) must certainly be included. Just now this handsome tree is conspicuous from the clusters of bright yellow flowers which cover the leafless branches. More showy than the flowers of the native Sugar Maple they are less delicate in color, while the flower clusters lack the grace of the slender drooping racemes of the American tree, which make the flowering term of the Sugar Maple a term of peculiar charm.

In the last issue of these Bulletins something was said of the value of the hybrid *Forsythia intermedia* as a garden plant. Another hybrid of the same origin, which was raised in Germany and is called *F. intermedia spectabilis*, is flowering in the Arboretum for the first time. The flowers are larger and of a deeper color than those of the parents with narrower but longer corolla lobes. This new hybrid promises to be a garden plant

of exceptional value. It may be seen among the other species and hybrids in the rear of the bank of Forsythias on the left hand side and at the lower end of the Bussey Hill Road.

Many of the species of Ribes (Currants and Gooseberries) in the Shrub Collection are already covered with nearly full grown leaves; and a few of them, including the Rocky Mountain *R. cereum*, are in flower.

In the Rhododendron collection at the base of Hemlock Hill a number of plants of *R. praecox*, Little Gem, are covered with clusters of pale lilac colored flowers. This plant was raised several years ago in the Vietchian Nursery in England by crossing the Siberian *R. dahuricum* with *R. praecox*, *R. praecox* being a hybrid between *R. dahuricum* and the Himalayan *R. ciliatum*. The Little Gem Rhododendron is a dwarf and perfectly hardy plant, and the earliest of the evergreen Rhododendrons in the collection to flower. It blooms, however, so early that unless an exceptionally favorable place can be secured for it the flowers are too often ruined by frost.

Two American shrubs which have been used largely in the Arboretum for ground cover are now in flower and may be seen along the borders of several of the drives. They are the Fragrant Sumach (*Rhus canadensis* or *aromatica*) and the Yellow Root (*Zanthorhiza apiifolia*). The former is rather a straggling plant with slender stems sometimes three or four feet high, although in one of its forms this plant grows much more compactly. The flowers are bright yellow in small axillary clusters which appear before the three-lobed leaves. This has been found a useful plant in the Arboretum, although as a ground cover it has not proved as successful as the Yellow Root. This does not grow so tall, and spreading rapidly by underground shoots soon thickly covers the ground with its erect stems. The small purple flowers are produced on terminal erect or spreading racemes and open before or with the unfolding of the pinnate leaves, which become clear bright yellow in the autumn. On the whole this is the most satisfactory shrub, for covering the ground among trees and larger shrubs, which has been tried in the Arboretum.

The careful examination of the opening buds and unfolding leaves of trees and shrubs can give much pleasure and greatly help to an accurate knowledge of these plants. Nearly every species differs in the color of the very young leaves and in the nature and amount of the hairs which protect them in the bud. At this time the young leaves of the Horsechestnuts or Buckeyes, of the Shadbushes, of several Maples, and especially of the Moosewood (*Acer pennsylvanicum*), of the Viburnums, and of many other plants in the Arboretum, are, if carefully examined, objects of great beauty; and in the young leaves are often found important characteristics for distinguishing species. All the American Oaks, for example, differ in their very young leaves, and some of them, like the Black and Scarlet Oaks, which are often difficult to recognize by their fully grown leaves, are easily distinguished by their very young leaves. All the American Oaks which are hardy in New England can be seen in the valley between the upper end of the Bussey Hill Road and the Valley Road, and in a few days their young leaves will be in condition to study.

The flowers of the Chinese Magnolias, Forsythias, Asiatic Cherries, and early Plum-trees and the expanding buds of a large number of trees and shrubs make this a good time for an early spring visit to the Arboretum.

The Arboretum will be grateful for any publicity given these Bulletins.

ARNOLD ARBORETUM

HARVARD UNIVERSITY

BULLETIN

OF

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JAMAICA PLAIN, MASS.

MAY 9, 1912

BULLETIN NO. 21.

Although seldom cultivated and little known in this country, several of the wild Pear-trees are plants of ornamental value as their large white flowers, which open before or with the leaves, and the silvery foliage of several of the species are handsome in the spring. The genus *Pyrus* (the Pears), is now considered distinct from *Malus* (the Apples), and *Cydonia* (the Quinces); it is distributed with a dozen or fifteen species from southern Europe to the Caucasus, through Persia to the Himalayas, and northward to northern China, the largest number of species being found in southeastern Europe and the Caucasus. The genus is widely distributed and much cultivated in China where more species certainly occur than are now recognized by botanists. There is no native Pear-tree in northern Asia or in Japan, and the genus has no New World representative. This comparatively restricted range of the Pears is remarkable, for wild Apples occur in nearly all the countries of the north temperate zone. The Pears do not show such a tendency to hybridize as the Apples, although some of the wild European forms are sometimes considered on slight evidence natural hybrids; and in the United States undoubted hybrids between some of the cultivated varieties of the common Pear (*P. communis*), and cultivated plants of one of the Chinese species have appeared, and these hybrids have been largely planted for their fruit in different parts of the United States. The best known of these are the Keifer and the Leconte.

The Arboretum collection of wild Pear-trees is planted on the left-hand side of the road entering from the Forest Hill Gate, above the collection of Apples. Some of the species will be in flower during the week and others will be interesting from the beauty of their unfolding leaves. The earliest Pear to flower is from northern China and is now called *P. Simonii*. It is one of the green-leaved species and, unlike those of all other Pear-trees, the leaves turn bright scarlet in the autumn. The fruit is small, light yellow, juicy, of good flavor, broadest at the base and gradually narrowed toward the apex. The handsome flowers and the brilliancy of the autumn leaves make this a valuable ornamental tree. A number of species with more or less silvery white leaves from southern Europe and the Caucasus will soon be in flower. Among them are *P. malifolia*, *P. amygdaliformis*, *P. elaeagnifolia*, *P. Michauxii*, *P. salicifolia*, *P. parvifolia*, etc. One of the handsomest plants in the collection is *P. betulifolia* from northern China, with crowded clusters of rather small flowers which are followed by globose fruits not much larger than peas. This is a very hardy, vigorous, tall, fast-growing tree. Among the plants grown in the Arboretum as *P. sinensis* are two very distinct forms raised from seeds sent here from Peking thirty years ago. They are both tall, shapely trees with large flowers and large, thick, lustrous leaves. One of these Pear-trees produces globose, yellow, juicy fruit, and is perhaps the wild type or one of the forms of the excellent yellow Pear which is brought in different sizes and great quantities to the Peking markets in September and October. The other form produces brown, hard fruits not more than half an inch in diameter; and on some trees the fruit is globose and on others pear-shaped. The Japanese Sand Pear, with its hard, brown, round fruits may perhaps have been derived from this Chinese plant.

The White Willow (*Salix alba*) is now covered with its bright yellow catkins and makes a charming picture in the landscape. This is the largest and the most common Willow tree of New England where it has often grown to a noble size and assumed a picturesque habit. It is a European tree, and it is of interest that it is the only exotic tree that has really become widely naturalized in New England. There are many forms of this Willow and the one which has most often established itself here is the variety *coerulea*. There is no record of the introduction of this tree into America, but it was probably soon after the settlement of the country, for very old trees can be found here, and it must have taken a long time for it to have spread as generally as it has done. Occasionally plants of the Brittle Willow (*S. fragilis*) may be seen in this part of the country, but in some of the middle states it is now completely naturalized, having been brought there many years ago to provide charcoal for the powder works in Delaware.

The most interesting plants now in flower in the Shrub Collection will be found among the Currants and Gooseberries (*Ribes*). The two yellow-flowered American Currants are already in bloom. The better known of these, the so-called Missouri Currant (*Ribes odoratum*) was for many years a favorite garden plant in the United States and is still found in many old gardens. It is a large, broad, very hardy, fast-growing shrub with drooping clusters of bright yellow fragrant flowers and lustrous black fruits. It owes its popular name to the fact that it was first found on the upper Missouri River, and it is now known to occur on the great plains from South Dakota to Texas. In many books this plant appears as *R. aureum*, but this name properly belongs to a smaller plant from the northwest and the northern Rocky Mountains with more slender branches, smaller flowers, and black or orange-colored fruits. This species appears to be extremely rare in cultivation. The two plants are growing together in the Shrub Collection and the differences in their general appearance and in the structure of the flowers can be readily seen. Among the Gooseberries already in flower the most interesting perhaps are *R. pinetorum* from the mountains of New Mexico and Arizona, with bright, orange-red flowers; *R. niveum* from northwestern North America with pure white flowers; *R. cynosbati* from eastern North America, and its spineless variety, *R. curvatum* from Stone Mountain, Georgia, with white flowers gracefully drooping on long stalks; *R. stenocarpum* from western China with white flowers, and *R. robustum*, a vigorous white-flowered plant of unknown origin but supposed to be a hybrid between *R. niveum* and *R. oxyacanthoides*.

The first of the Honeysuckles to bloom this year is *Lonicera coerulea*, a plant with small yellow-white flowers and early ripening bright blue fruit. It is one of the most widely distributed of the shrubs of the northern hemisphere, being found in numerous forms and varieties in the northern part of North America, Europe and Asia. There are several distinct forms of this plant now flowering in the Shrub Collection. The pink flowered *Lonicera gracilipes* from Japan and the Fly Honeysuckle of northeastern North America, (*L. canadensis*) are also in flower in the collection where Honeysuckles will continue to blossom for several weeks.

The earliest Barberry in the Arboretum to flower this year is *Berberis dictyophylla* which, although it comes from the warm province of Yunan in China, has proved perfectly hardy here. The flowers are solitary or

occasionally in pairs in the axils of the leaves, rather less than half an inch in diameter and pale primrose yellow in color. They are produced this year in profusion, but the greatest beauty of this plant is in the leaves which, although not large, are silvery white on the lower surface and in the autumn turn brilliant scarlet on the upper surface while the lower surface retains its spring and summer color. This Barberry was sent to Europe a dozen years ago and soon reached the Arboretum where it is one of the handsomest shrubs of comparatively recent introduction. It can be seen in the Shrub Collection and among the Barberries on Hickory Path near Centre Street.

The Hobble Bush or Moosewood (*Viburnum alnifolium* or *lantanoides*) is the first of the genus to flower here and one of the handsomest shrubs of northeastern North America where it grows in cold moist woods. In cultivation it is occasionally seen in good condition, growing to a large size, flowering freely, and spreading by the rooting of its inclining branches, but it has never done well in the Arboretum where the right place for it has probably not yet been found. The Hobble Bush is one of the species with broad flat flower-clusters surrounded by greatly enlarged neutral white flowers, the flowers opening with the unfolding of the leaves. A plant just coming into flower can be seen among the dwarf Birches on the left-hand side of the Bussey Hill Road and just below the point where it turns abruptly to the left in ascending the hill.

In *Prinsepia sinensis*, a member of the Rose Family and a native of northern China, the Arboretum has an interesting addition of recent introduction to its list of hardy shrubs. *Prinsepia sinensis* has small, axillary, bright yellow flowers, which are produced in profusion, and it is one of the earliest shrubs in the Arboretum to expand its bright green leaves which are nearly fully grown when the flower-buds open. It is now in bloom on the right-hand side of Hickory Path, going from the Valley Road, close to Centre Street.

The hybrid *Spiraea arguta* (*multiflora* x *Thunbergii*), which is one of the handsomest of the early flowering Spiraeas, is a more desirable plant here than *S. Thunbergii* which flowers at the same time, but is never vigorous and is often injured by cold. This hybrid is in the Shrub Collection and large plants in flower can be seen in the supplementary Spiraea Collection on the short path between the two branches of Hickory Path near the middle of the Hickory Group.

The Hickories are rapidly expanding their leaf-buds and these as they open are beautiful and interesting because the inner bud-scales rapidly enlarge before falling, and on some trees are bright red and on others yellow or green, appearing like the petals of some great flower. The beauty of these scales lasts for only a few days, but as the buds of the different species open during a period of at least two weeks, an observer who is able to visit the Arboretum several times at this season can see all of the Hickories which are hardy here at an interesting period of their development.

The Arboretum will be grateful for any publicity given these Bulletins.

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Some of the earliest flowering Apple-trees are already in full bloom and during the next two or three weeks flowers can be seen on some of the species and varieties. Much attention has been paid to these plants at the Arboretum where they are arranged in two groups. The original group is on the right-hand side of the Forest Hills Road going towards the gate. The situation is not a good one, the space is very limited, and a few years ago a second collection was established at the eastern base of Peter's Hill. The plants here are smaller than those in the original group but the number of individuals and of species and varieties is much greater, and here will be found specimens of all the Crabapples that the Arboretum has been able to obtain. The study and proper comprehension of these plants are full of difficulties, for many of the species hybridize so freely that seedlings raised from seeds of cultivated plants rarely produce the original type, and wild plants or seeds from isolated wild plants of the Old World species are almost impossible to obtain. The common Apple-tree of orchards even is now generally believed to be a hybrid between the two European species; the so-called Siberian Crabs of American pomologists are supposed to be hybrids between the Common Apple and the Siberian *Malus baccata*, and the number of other varieties supposed to be hybrids is large, including two which have already appeared in the Arboretum.

One of the handsomest of all Crabapples, *Malus floribunda*, is one of the earliest to flower. As it grows in this country it is a broad shrub, with a trunk dividing at the base into several large branches. The pink flowers, which are deep rose color in the bud, turn white before the petals fall and are produced in the greatest profusion. The dark green foliage is abundant but the yellow or orange-colored fruits, which are not much larger than peas, make little show. The origin of this plant is uncertain; it was first sent to Europe from Japan but it is not a native of that country where it was probably introduced from China, although it does not appear to be known in China now in a wild state. By some authors it is considered a hybrid between two of the species of northern China, although it bears but little resemblance to its supposed parents. The largest specimens of this Crabapple will be found in the neighborhood of the Administration Building. A plant which is evidently a hybrid of *M. floribunda* appeared spontaneously in the Arboretum several years ago and has been named *Malus Arnoldiana*. It has much larger pink flowers and larger fruit than *M. floribunda*, and in flower is one of the most beautiful of all Crabapples.

The Crabapple of eastern Siberia, *Malus baccata*, is a tall narrow tree with white flowers on long, drooping stems and very small yellow fruits from which the calyx falls before the fruit ripens. There is a fine old specimen of this tree in front of the gardener's house in the Harvard Botanic Garden at Cambridge. In the Arboretum a number of forms of this species have been raised. They are distinguished from the Siberian tree by larger pure white flowers and larger fruits than those of *M. baccata*. Some of these forms are among the most beautiful of the early flowering Crabapples.

Malus spectabilis from northern China is a tall shrub or small tree with erect, slightly spreading stems, large pink flowers which in the cultivated plants are more or less double, and medium-sized yellow fruits. This is an old inhabitant of gardens where several forms have appeared. The handsomest of these is known as the Rivers Crab (*M. spectabilis Riversii*) from the English nurseryman by whom it was raised or distributed. The Parkman Crab (*M. Halliana*) owes its name to the fact that it was first cultivated outside of Japan by Francis Parkman, the historian, who received it from there in 1860. It is a small and not very vigorous tree with dark bark and bright, clear pink, semidouble flowers drooping on long, slender stalks. This is a Chinese plant now only known in gardens and long cultivated in those of Japan. It should be in a list of the four or five most beautiful Crabapples. Another handsome plant in this group is *Malus Scheideckeri* which is supposed to be a hybrid between *M. floribunda* and *M. prunifolia*. It is vigorous and fast-growing, with erect stems which form a narrow head, pink and white flowers and light yellow fruits.

Interesting species now well established at the Arboretum are *Malus zumi* from Japan, with pink and white flowers, *M. toringo* from northern China and Japan, and *M. Sargentii* from Japan. The two last flower late, have small flowers in crowded clusters and are distinguished by the three-lobed leaves on the shoots of the year. Unlike all other Crabapples, *M. Sargentii* is a low shrub growing naturally on the borders of salt marshes.

The so-called Siberian Crabapples of pomologists are trees of much ornamental value and are well worth cultivating for the beauty of their flowers and fruits; they are fast-growing trees with straight stems and pyramidal heads, large white flowers, and brilliant, often translucent, red or yellow, long-hanging fruits. The fruit is used in preserves and jellies, and for their fruits these trees are much grown in regions too cold for the successful cultivation of the common Apple. One of the most curious Apple-trees in the collection, *M. Niedzwetzkyana*, has deep purplish red flowers and fruit, even the flesh being purple, purple leaves at least early in the season and dark bark. It comes from central Asia and is probably a form of *M. pumila*, one of the parents of the common Apple-tree, as seedlings raised in the Arboretum have sometimes purple but more often green leaves.

The Apple of the northwest coast (*M. fusca* or *rivularis*), with its distinct oblong fruits, can be seen in the group on the Forest Hills Road and with it a hybrid of this species and the common Apple, which has been named *M. Dawsoniana*. The Crabapples of eastern North America bloom later than the Old World species. They all have large, pink, fragrant flowers, and fragrant, green or yellowish fruit characterized by the sticky exudation with which it is covered. There are large plants of *M. coronaria* and *M. ioensis*, the two common eastern species, in the Forest Hills group opposite the end of the Meadow Road. There are large plants of the southern *M. angustifolia* on Hickory Path opposite the large group of Pterocaryas; and in the Peter's Hill group can be seen flowering plants of *M. glaucescens*, a species recently distinguished in western New York and now known to range along the Appalachian Mountains to North Carolina. The last of the Crabapples to flower is the

double-flowered form of *M. ioensis*, known as the Bechtel Crab. This tree has double pale pink flowers which look like small clustered Roses, and attract so much attention that the ground around the trees is trodden hard every day by visitors who wish to examine them at close range. There are two trees of the Bechtel Crab opposite the end of the Meadow Road.

The earliest of the American Hawthorns to flower in the Arboretum this year is *Crataegus Arnoldiana*. This is one of the large-leaved, large-flowered, and large-fruited species, and even in winter is easily recognized by its numerous thorns and by the zigzag manner in which its erect branches grow. The flowers open as the leaves expand and the brilliant scarlet fruit ripens toward the end of August and then soon falls. The early ripening of the fruit makes this tree valuable because showy fruits are not common here in summer. *C. Arnoldiana* grows naturally on a wooded bank in the Arboretum and on the Mystic River in West Medford, Massachusetts. When botanists called all American Thorns with red fruits *C. coccinea* or varieties of that species *C. Arnoldiana* was included. There are a number of large plants in the shrubbery on the right-hand side of the Meadow Road, between its junction with the Bussey Hill Road and the Centre Street Gate. There is a plant, too, in the collection of *Crataegus* between the Shrub Collection and the Parkway, and there are a number of others on the right-hand side of the Meadow Road in front of the group of White Oaks. These trees will be in flower next week.

The earliest flowering plants of *Rhododendron (Azalea) Kaempferi* are beginning to show the color of their flowers. There are two large groups of these plants in the Arboretum, one on the left-hand side of Azalea Path and the other on Hemlock Hill Road where they are planted in a long narrow belt between the Hemlocks and the Laurels. The plants on Azalea Path being exposed to the sun flower earlier and fade quickly as the delicate flowers are unable long to resist our sun. This handsome plant is a native of the high mountains of Japan and was first cultivated in the Arboretum where it was raised from seeds collected in 1902 by Professor Sargent. On Azalea Path many of the plants will soon be in full flower, but those in the shade of the Hemlocks will not be at their best probably for a couple of weeks, but when their flowers do open here they will furnish one of the great sights of the Arboretum year.

Viburnum Carlesii, a native of Korea, is flowering in the Arboretum for the first time. It appears to be very hardy and promises to be a first-rate ornamental plant here. The flowers are produced in compact clusters and are very fragrant. The open flower is pure white but the bud is pink, and as all the flowers do not open at the same time the contrast between the pink buds and the white flowers adds to the beauty of the cluster. There are small plants of this species in the *Viburnum* group on the right-hand side of the Bussey Hill Road near the nursery.

The Arboretum will be grateful for any publicity given these Bulletins.

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Many of the Lilacs are now in flower and persons interested in these plants should visit the Arboretum during the next few days, although the flowers of several of the species will continue to open until the end of June.

The plant with which the popular idea of Lilac is associated, and which for New England and other regions with cold winters and hot summers, is one of the most beautiful and successful of all shrubs is *Syringa vulgaris*. It is a plant for the north, for in southern New England and southward the leaves in summer are often temporarily disfigured by a white mildew. This plant was sent from Constantinople to Vienna about 1560 and soon reached western Europe, as the purple and white varieties were cultivated by Gerard in England in 1597. The Lilac was long believed to be a native of Persia, and it is only in comparatively recent years that its home has been found to be among the mountains of Bulgaria. A few years ago the Arboretum succeeded in obtaining seeds from wild Bulgarian plants and the seedlings raised from these seeds will bloom here this year for the first time. For more than two centuries only the purple and white varieties were cultivated; then a few selected seedlings appeared in gardens, and in the last thirty or forty years a great deal of attention has been paid in France and Germany to improving the Lilac. In the Arboretum collection there are now one hundred and twenty of these named varieties and there are others for which room cannot be found. Further improvement in these plants by selection can hardly be expected; indeed some of the oldest varieties are still the best, and many of the seedlings of recent years are so much alike that many of them are not worth cultivating. Indeed, in a dozen selected varieties nearly all the good qualities and the greatest beauty of modern garden Lilacs can be found. If there is not much now to be expected from new seedlings of *Syringa vulgaris*, the making of hybrids between the species promises interesting and valuable garden plants if we can judge by the excellence of a few hybrid Lilacs, which have already been raised. The first of these hybrids, the Rouen Lilac, was raised in 1795 in France and is the result of crossing *Syringa vulgaris* with the small, late-flowered *Syringa persica*. The oldest name for this plant is unfortunately *Syringa chinensis*, given to it through a misunderstanding of its origin; it is also known as *S. rothomagensis*. It is very vigorous and is intermediate in character between its parents. The flowers are reddish purple, fragrant, and produced in long comparatively narrow clusters which weigh down the slender branches; there is a variety with nearly white flowers. This hybrid is among the best of all garden Lilacs.

A hybrid between *S. vulgaris* and *S. oblata* with small, semi-double, very fragrant, purple flowers, known as *S. hyacinthiflora*, is one of the earliest of all Lilacs to flower and is a vigorous, large-growing and very hardy plant. *S. oblata*, one of the parents of this hybrid, is a native of northern China and has been in flower for several days. The large pale lilac flowers are very fragrant and are produced in more or less irregular

clusters. The leaves are thick and leathery in texture, and, unlike those of all other Lilacs, turn in the autumn to a deep bronze red color. In gardens this plant becomes a tall, broad shrub, but the brittleness of the branches, which are often broken down by snow or ice, reduces its value.

Two other Chinese Lilacs bloom as early or earlier than *S. oblata*. These are the white-flowered *S. affinis* and the lilac-flowered form of this species, called var. *Giraldii*. *S. affinis* is the common and perhaps the only Lilac cultivated in the gardens of Peking in which great masses of it are sometimes seen. The variety comes from the province of Shensi. The flowers of these two Lilacs are fragrant and beautiful, but the open irregular habit of growth assumed by these plants in the Arboretum is not attractive. If they become more shapely with greater age, they will be garden plants of real value. *S. pubescens* is just opening its very fragrant, long-tubed, rather small flowers; this is a native of northern China, and is hardy, free-flowering, and one of the most beautiful of all Lilacs. It is still little known in gardens. The Persian Lilacs (*S. persica*) bloom rather later than the common Lilacs. This beautiful plant has been known in gardens for two centuries and a half, and there are purple and white-flowered varieties and a form with deeply-divided leaves (var. *laciniata*) which is less vigorous than the others. One of the least beautiful of Lilacs is the Hungarian *S. Josikaea*, a tall, slender shrub with narrow elongated clusters of small purple flowers which open later than those of the Persian Lilac. By crossing this plant with the Chinese *S. villosa* a remarkable race of hybrids was produced in Paris a few years ago. This hybrid race has the vigor, good habit, and large flowers of *S. villosa*, and the purple flowers of *S. Josikaea*. The general name for this race of hybrids is *S. Henryi*, from the horticulturist who produced it, and the best known and most beautiful of these hybrids is called *Lutèce*. This is a plant which should be in general cultivation. *S. villosa* blooms later than the other Lilacs and is therefore more valuable. It is a large, vigorous, and very hardy shrub with good foliage and numerous clusters of pale pink or rose-colored flowers which, unlike those of the other true Lilacs, have a disagreeable odor. A hybrid between *S. affinis*, var. *Giraldii*, and the common Lilac has been produced in France and is highly spoken of. It has not yet flowered in the Arboretum.

On the right-hand side of the South Street entrance are large plants of *Crataegus mollis* and on the left-hand side there is a plant of *C. arkansana*, and next to it and nearer the gate a plant of *C. submollis*. These trees, which are now in full flower, belong to the section Molles of the genus which has large leaves, large flowers and large, usually scarlet fruit. *C. mollis* is one of the common Hawthorns of the middle and western states where on bottom-lands it grows to a large size. Its fruit ripens and falls in September. *C. arkansana*, a native of central Arkansas, is a handsomer tree distinguished by its long, wide-spreading, more or less horizontal branches; the fruit ripens late and remains on the branches until the end of November. *C. submollis* is a native of eastern Massachusetts, with pear-shaped fruit which ripens and falls in September. These trees and a number of other Hawthorns were raised at the Arboretum from seeds planted about 1880. When fifteen or twenty years later they began to flower it was seen that many of them were un-

like any of the described species. This fact led to the general study of American Hawthorns which has been carried on at the Arboretum during the last twelve years. During these years three thousand lots of seeds collected from wild plants in different parts of the country have been planted and thousands of seedlings have been raised and distributed. A set of these seedlings has been planted on the eastern slope of Peter's Hill where the oldest of them are already beginning to flower.

On the left-hand side of the South Street entrance may also be seen the largest plant in the Arboretum of the Ohio Buckeye (*Aesculus glabra*) now in full flower. The earliest blooming of the American Magnolias, *M. Fraseri*, is unfolding the pale-yellow petals of its large flowers which open as the leaves begin to expand. This native of the forest of the southern Appalachian Mountains is a comparatively small tree; it does well at the Arboretum where it flowers freely every year. It can be seen in several specimens with the other American Magnolias on the right of the Jamaica Plain entrance and between the gate and the Administration Building.

In the Shrub Collection the red-fruited Elders are in full flower and are handsome shrubs, especially in early summer when their brilliant fruit ripens. In the collection can be seen the North American *Sambucus pubens*, the European and Siberian *S. racemosa* and their varieties, and the Japanese *S. racemosa* var. *Sieboldiana*. This is a very vigorous large shrub, and although the flower and fruit clusters are smaller than those of the other forms of this group, the bronze color of the finely divided leaves makes it particularly attractive at this season.

The large plant of *Fothergilla major* with its attractive heads of white flowers is now in full bloom in the Witch Hazel Group near the pond at the end of the Meadow Road; it is also in the Shrub Collection. Many of the Bush Honeysuckles are beginning to flower. One of the most conspicuous of the early-flowered species of this group is *Lonicera chrysantha* from eastern Siberia. A large plant of this can be seen on the right-hand side of the Bussey Hill Road opposite the Lilacs, and here, too, are several large plants of some of the hybrids of the Tartarian Honeysuckle.

An illustrated guide to the Arboretum containing a map showing the position of the different groups of plants has recently been published. It will be found useful to persons unfamiliar with the position of the different groups of plants. Copies of this guide can be obtained at the Administration Building in the Arboretum, from the Secretary of the Massachusetts Horticultural Society, 300 Massachusetts Avenue, Boston, from The Houghton, Mifflin Company, 4 Park Street, Boston, at the Old Corner Bookstore, Bromfield Street, Boston, and at the office of the Harvard Alumni Bulletin, 50 State Street, Boston. Price, 30 cents.

The Arboretum will be grateful for any publicity given these Bulletins.

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ARNOLD ARBORETUM

HARVARD UNIVERSITY

BULLETIN

OF

POPULAR INFORMATION



JAMAICA PLAIN, MASS.

MAY 29, 1912

BULLETIN NO. 24.

Next to the Lilacs the most conspicuous shrubs now in the Arboretum will be found in the group of Bush Honeysuckles. Among these are some of the hardiest and generally most successful shrubs for northern gardens. They not only produce countless beautiful and fragrant flowers but their fruits, which usually ripen in summer, are equally beautiful and abundant. The best known of these plants, the Tartarian Honeysuckle (*Lonicera tatarica*), a native of the region from southern Russia to the Altai and Ural Mountains, is an old inhabitant of gardens where formerly it was more often seen than it is at present. This is a vigorous plant, growing ten feet high or more and equally broad, and there are varieties with white, pale yellow, pink and rose-colored flowers, and with yellow and red fruits. Interesting and valuable hybrids of this plant have appeared in European gardens. One of the handsomest of these, *L. notha*, with pale pink flowers, is believed to be the result of a cross with *L. Ruprechtiana* from northeastern Asia. There are two large specimens of this plant on the right-hand side of the Bussey Hill Road opposite the Lilac Group. There is here also a large plant of *L. bella*, with pale yellow flowers, the result of a cross between *L. tatarica* and *L. Morrowii*. *L. xylosteoides*, with white flowers, a hybrid between the Tartarian Honeysuckle and *L. Xylosteum*, and *L. muendeniensis* with pale yellow flowers, a hybrid of the Tartarian Honeysuckle with *L. Morrowii* from northeastern Asia, are also handsome and desirable plants.

Other interesting plants now in flower are *L. muscaviensis*, with pale yellow flowers, a hybrid between two species of northeastern Asia, *L. Morrowii* and *L. Ruprechtiana*, *L. Segreziensis*, with white flowers, a hybrid between *L. quinquelocularis* and *L. Xylosteum*, *L. multiflora* with white flowers, a hybrid between *L. micrantha* and *L. Morrowii*. The translucent fruit of this plant is perhaps the most beautiful of all the Honeysuckle fruits produced in the Arboretum. *Lonicera Korolkowii* is a vigorous plant from Turkestan with pale bluish foliage and small rose-colored flowers; equally beautiful are the var. *floribunda* of this species and a hybrid of the species with *L. tatarica* which appeared in the Arboretum and is known as *L. amoena Arnoldiana*. These three plants are of exceptional value from the beauty of their delicate flowers and foliage.

Attention is also called to three Honeysuckles from northeastern Asia, *L. Ruprechtiana* with narrow leaves and large yellow flowers, *L. Maackii* with pure white flowers, and *L. Morrowii* with white and yellow flowers. The flowers of *L. Maackii* are large and make a handsome contrast with the dark green leaves. The form of this species from western China, var. *podocarpa*, is in every way a less desirable garden plant. *L. Morrowii* is a large, round-headed shrub with pale, gray-green foliage and wide-spreading branches, the lowest clinging close to the ground. This plant is well suited for the formation of dense thickets or to border drives and walks where abundant space can be given to it, as can be seen at several points in the Boston Park System. A hybrid between *L. Morrowii* and *L. tatarica* is often sold in American nurseries as *L. Morrowii* itself, but it is a very inferior plant to either of its parents.

Outside the Boston parks, where a few of the strong-growing Bush Honeysuckles have been planted, they are rarely seen in American collections in spite of their great beauty and value. They need good soil and plenty of space in which to develop naturally or much of their beauty is lost. The habit these plants assume as they attain their full size can be seen on the right-hand side of the Bussey Hill Road and along the Arborway between Jamaica Pond and the entrance to the Arboretum.

Some of the small-growing Bush Honeysuckles from central and western China now in flower in the Shrub Collection deserve careful examination. Some of the most interesting species are *L. syringantha* and *L. syringantha*, var. *Wolfii*, with purple flowers, from western China, *L. tibetica* and *L. tangutica* from the same region, and *L. coerulea gracilipes*, with pale yellow drooping flowers, from Turkestan.

To many people the word Horsechestnut stands only for the great tree from the mountains of Greece with large clusters of white flowers blotched with red which has been planted for at least a hundred years in the United States where it is one of the most satisfactory of all exotic trees. But there are many other Horsechestnuts, both trees and shrubs, as may be seen by the examination of a group of these plants on the right-hand side of the Meadow Road and just beyond the Linden Group. Some of the hybrids are of much interest and of these the best known now is the so-called red-flowered Horsechestnut, *Aesculus carnea*, a hybrid probably between the Grecian tree (*Ae. Hippocastanum*) and the red-flowered *Aesculus Pavia* from the southeastern United States, although the history of the origin of this tree is unknown. A form or variety of this hybrid, known as *Ae. carnea Briotii*, appeared about forty years ago in a French nursery and is a tree with handsomer and much darker-colored flowers than the ordinary red-flowered Horsechestnut. The beauty of these flowers can be seen on two small plants now flowering in the collection. *Ae. glabra*, the Ohio Buckeye, and some of its varieties, *Ae. octandra* and hybrids between the last and *Ae. Pavia*, known under the general name of *Ae. versicolor*, are also in flower. These hybrids and varieties of the American Horsechestnut were popular garden plants in France in the first half of the last century but they have now largely disappeared from cultivation and are difficult to obtain. One of the oldest and largest collections to be found now anywhere is in the Mt. Hope nurseries at Rochester, N. Y.

The large and abundant flowers of *Magnolia Fraseri*, mentioned in the last number of these bulletins, are now fully open. Two other American Magnolias in the same group are also in flower, *M. acuminata* and *M. cordata*. *M. acuminata*, the Cucumber-tree, is a large tree with small, yellow-green, not very conspicuous flowers. This is the most northern in its range of the American Magnolias and is a hardy, fast-growing tree of rather formal pyramidal habit while young; it is a distinct and desirable tree for northern plantations in which in good soil it can grow to a large size. *M. cordata* is a smaller, round-headed tree with thicker and darker-colored leaves and small, bright canary yellow flowers. This beautiful tree is supposed to have been carried to France from the mountain forests of northern Georgia or of the Carolinas at the beginning of the last century. It has not been rediscovered, however, or a tree exactly like it has not been rediscovered in the south, and it is now only known as a cultivated tree. The plants in the Arboretum were obtained by

grafts taken from the old trees in the Harvard Botanic Garden at Cambridge where they were probably planted soon after the establishment of the Garden. This tree usually bears a second crop of flowers during the summer but does not produce fruit, so that it can be propagated only by grafts and therefore remains extremely rare in cultivation.

Viburnum prunifolium is in flower and can be seen on the right-hand side of the Bussey Hill Road opposite the Lilacs and at several points on the Valley Road. It is one of the three arborescent *Viburnums* of the United States and is a small tree with spreading branches and compact clusters of pure white flowers which are followed by blue-black fruit. It is one of the handsomest of the American *Viburnums* and is too rarely found in gardens.

On the right-hand side of the Meadow Road there is a fine group of the northern pink-flowered *Rhododendron* (*Azalea*) *canescens* in flower and this plant can be seen on Azalea Path and in some of the other plantations. It is one of the earliest of the eastern American *Azaleas* to flower and during the next six weeks other species will bloom in the Arboretum where they are much hardier and in every way more satisfactory than the so-called Ghent *Azaleas* which are hybrids too often weakened by crosses with the tender yellow *Azalea* of the Caucasus or with the short-lived Japanese *A. mollis*. For American gardens American *Azaleas*, though not often cultivated, have proved themselves more satisfactory than any of the hybrids in part raised from them.

The pale pink buds of the opening flowers of the hybrid *Spiraea nudiflora* in the Shrub Collection make this plant conspicuous at this time among the large number of species and hybrids of this genus.

Of the immense tropical and subtropical genus *Symplocos* only one species is hardy in New England. This is the Japanese *S. crataegoides*, a large shrub with clusters of small white flowers just now opening and bright blue fruits which make this plant particularly attractive in the autumn. It is in the Shrub Collection and there are large specimens in the grass border between the drive and the walk on the left-hand side of the Bussey Hill Road above the Lilacs.

Vaccinium corymbosum, the High-bush Blueberry of New England swamps, has been largely planted in different parts of the Arboretum and is now covered with its white bell-shaped flowers. This is one of the most beautiful shrubs of eastern North America. The habit is good, the flowers and fruit are beautiful, and no other plant has more splendid autumn color.

An illustrated guide to the Arboretum containing a map showing the position of the different groups of plants has recently been published. It will be found useful to persons unfamiliar with the position of the different groups of plants. Copies of this guide can be obtained at the Administration Building in the Arboretum, from the Secretary of the Massachusetts Horticultural Society, 300 Massachusetts Avenue, Boston, from The Houghton, Mifflin Company, 4 Park Street, Boston, at the Old Corner Bookstore, Bromfield Street, Boston, and at the office of the Harvard Alumni Bulletin, 50 State Street, Boston. Price, 30 cents.

The Arboretum will be grateful for any publicity given these Bulletins.

ARNOLD ARBORETUM

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JAMAICA PLAIN, MASS.

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BULLETIN NO. 25.

Viburnums have been largely planted in the Arboretum and the abundant and conspicuous flowers now open on several of the species show the value of these plants for the decoration of parks and gardens. *Viburnums* are found in all the temperate parts of the northern hemisphere, the largest number of species growing in eastern Asia and in the eastern United States. The eastern American species, all things considered, are more valuable garden plants than those from other parts of the world, although there are a few Old World species which must be counted among the best of all hardy shrubs. Among these Old World species which cannot be spared from our collections are the European Wayfaring-tree, *Viburnum Lantana*, the Japanese and Chinese *V. tomentosum*, and the Japanese *V. dilatatum*. The first of these plants is a large shrub or small tree with blue-green foliage, large convex clusters of flowers which are followed by fruits, which when fully grown are at first bright red and then become black, fruits of the two colors being found together in the same cluster. This is a very hardy and vigorous plant and flowers here early in May. *Viburnum tomentosum* is a large flat-topped shrub with wide-spreading horizontal branches, and in Japan sometimes becomes treelike in habit. It is one of the species in which the clusters of small perfect flowers are surrounded by a ring of abortive flowers with much enlarged pure white corollas. The flower clusters of *Viburnum tomentosum* are arranged along the upper side of the branches and are produced in great profusion, making it one of the most beautiful of all the shrubs now flowering in the Arboretum. The fruit is small, at first bright red and finally nearly black; the leaves turn orange and red in the autumn. A variety of this plant with very narrow leaves (var. *lancoelatum*) discovered by Professor Sargent in Japan is flowering in the recently arranged *Viburnum* Group on the right-hand side of the Bussey Hill Road near its junction with the Valley Road. The Japanese Snowball, known usually in gardens as *Viburnum plicatum*, is a form of *Viburnum tomentosum* (var. *dilatatum*). This must not be confounded, however, with the true *Viburnum dilatatum*, which will not be in flower probably for a couple of weeks. This is a large shrub with numerous clusters of creamy white flowers but is most interesting in the autumn when it is covered with small, bright red, lustrous fruits which remain in good condition for a long time.

Of the three species cultivated in the Arboretum of the *Opulus* Group of *Viburnums*, with palmately lobed and veined leaves and showy sterile flowers surrounding the flower clusters, two are from the Old World and are perhaps handsomer garden plants than the American representative of this group. The three species are *V. opulus*, from central and northern Europe, *V. Sargentii*, from northeastern Asia, and *V. americanum*, from northeastern America. The first is the largest plant of the three, with thicker darker green leaves late persistent in the autumn, and dark red fruit. The old-fashioned Snowball of gardens is a form of this species with all the flowers sterile; there is a very dwarf form which rarely flowers, and there is a form with yellow fruit. The flowers of *Viburnum Sargentii* are more showy than those of the other species, but the fruit is small and inconspicuous. The habit of *V. americanum*, the so-called High-bush Cranberry, is less compact than that of the other species. The flowers, however, are beautiful, and the fruit, which is translucent and very lustrous, remains on the branches through the win-

ter; in the autumn the leaves turn bright orange-red before falling. The three species are all very hardy. *Viburnum americanum* and *V. Sargentii* have been generally planted in the Arboretum, and very large plants of *V. opulus* can be seen on the Parkway and in some of the other Boston parks.

Among the other American species *Viburnum alnifolium*, the Hobblebush, and *V. prunifolium* have been mentioned in recent issues of this bulletin, and their flowers have already gone. The species which is now so conspicuous in many parts of the Arboretum is the Nanny-berry, *V. Lentago*. This common New England roadside plant is a large shrub or small tree with large, thick, lustrous leaves, large, rounded clusters of creamy white flowers which are followed by drooping blue-black fruits. There is no better or hardier plant for large shrubberies or the borders of woods, and much of the early June beauty of the Arboretum is due to its general use here. It is one of the three American arborescent species, the others being *V. prunifolium* and *V. rufidulum*. This last is a southern plant distinguished by its thick and shining leaves and by the thick red-brown, felt-like covering of the winter-buds and leaf-stalks. *V. rufidulum* is still rare in cultivation but fortunately it is hardy in the Arboretum. Young plants are now in flower in the Viburnum Group on the Bussey Hill Road.

On the right-hand side of the Bussey Hill Road, opposite the Lilacs, a large mass of *Viburnum pubescens* completely covered with small clusters of white flowers is now one of the most conspicuous objects in the Arboretum. This shrub grows from western New York westward and southward, and, although hardly known in gardens, is a first-rate garden plant. The eastern American species with bright blue fruits, *V. dentatum*, *V. venosum*, and *V. Canbyi*, will flower later in the order in which they are mentioned here. They are common wild plants in the regions they inhabit and are all greatly improved by good cultivation. They have been freely used in different parts of the Arboretum and their value for the decoration of American parks is at last beginning to be appreciated.

The Arrowwood, *Viburnum acerifolium*, will soon be in flower. This inhabitant of northern forests is a small, shade-enduring shrub with neat foliage, small flower-heads and black fruit. It can be seen in large masses on the right-hand side of Bussey Hill Road where in going up the hill it is the last of the small collection of Viburnums planted in the grass border between the drive and walk. *Viburnum affine*, considered a variety of *V. pubescens*, a rare plant from southern Missouri, is now flowering in the Viburnum Group where in the next two weeks flowers may be seen of the still rarer *V. molle* from the southern states. Persons interested in the cultivation of shrubs should study carefully at different seasons of the year the Viburnums which have been assembled in the Arboretum.

Enkianthus is an eastern Asiatic and Himalayan genus, with drooping clusters of small, bell-shaped flowers, and dry capsular fruits, and is related to Andromeda. Three Japanese species are well established in the Arboretum and can be seen in the Shrub Collection and in a large group on the right-hand side of Azalea Path. The handsomest of the three species, *E. campanulatus*, is a tall shrub with slender erect stems and branches, and light yellow or rose-colored flowers. It is found in every Japanese garden where it is valued for the bright scarlet color the leaves assume in autumn, and where it is often cut into balls and other fantastic shapes. This Enkianthus is a garden plant here of real value. The

other species, *E. japonicus* and *E. subsessilis*, are smaller plants with smaller yellow flowers and are less valuable ornaments of the garden.

Some of the most valuable shrubs now found in gardens are natural hybrids of related species or have been produced by skilful hybridizers. One of the most beautiful of Lilacs, *Syringa chinensis*, described in a recent issue, is a natural hybrid which appeared one hundred years ago in the Botanic Garden at Rouen. Several of the most attractive Honey-suckles are hybrids, and in recent years the crossing of different species in several genera has produced new races of garden plants which have vigor, hardiness and beauty not possessed by their parents. A good example of the value of such hybrids is found in *Deutzia Lemoinei*, obtained by a French nurseryman by crossing the Japanese *D. gracilis* with *D. parviflora* of northern China, and now in flower in the Shrub Collection. Although it resembles *D. gracilis* in habit, it grows into a taller and broader shrub; the flowers are larger and it is much hardier. It is certainly one of the best garden plants of recent introduction. The systematic crossing of shrubs with the object of creating new forms, except perhaps in the case of Roses, is a comparatively new industry, but it has already produced startling results in such genera as Magnolia, Deutzia, Philadelphus, Ceanothus, Rhododendron, and Diervilla; and with the great number of new shrubs discovered in recent years in eastern Asia and eastern North America at his disposal the hybridizer will now have new and abundant opportunity to show his judgment and skill in producing new races of plants. Hybrid trees are naturally less common than hybrid shrubs and, except in the case of fruit trees, comparatively few attempts to cross different species of trees have been made. Trees which are believed to be natural hybrids, however, are not rare. There are several American Oaks which are probably hybrids and these, so far as they have been tested in the Arboretum, grow more rapidly than their supposed parents. For example *Ulmus vegeta*, which is believed to be a hybrid between two European species, grows more rapidly than any other Elm-tree, and the so-called Carolina Poplar, which is not an American tree but probably a hybrid between the American Cottonwood and the European Black Poplar, outgrows, at least while young, all other Poplar trees.

Several of the Rhododendrons in the collection at the base of Hemlock Hill are in flower and the flower-buds of many others are fast opening. The end of this week and the beginning of next week will probably be the best time to visit this collection which is most easily reached from the South Street entrance where automobiles should be left.

This is one of the most interesting times of the year to visit the Pinetum, for many conifers are now in their greatest beauty, as the young shoots, of various shades of green or blue, are now growing rapidly on many of these trees and often afford good characters for distinguishing the Firs, Spruces and Pines. Particularly handsome just now are the Carolina Hemlock (*Tsuga caroliniana*), the Colorado White Fir (*Abies concolor*), the two Rocky Mountain Spruces (*Picea pungens* and *P. Engelmannii*), now bluer than they will be later in the season, and the Douglas Spruce, (*Pseudotsuga mucronata*). An entrance to the Pinetum is close to the Walter Street gate.

The Arboretum will be grateful for any publicity given these Bulletins.

No. 26

ARNOLD ARBORETUM

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BULLETIN NO. 26.

The Laurels (*Kalmia latifolia*) will be in full bloom at the end of the week. They are planted along the base of Hemlock Hill, and here the plants remain in flower for a long time, for they are protected from the full effects of the sun by the hill behind them and the soil is moist and cool. The beauty of the flowers, too, is heightened by the dark background of Hemlocks, and none of the flower displays in the Arboretum surpass the flowering of the Laurels which this year promise greater beauty than ever as the plants never before have been so covered with flowers-buds.

Kalmia is a genus which is found only in North America and, with the exception of one small species, is confined to the eastern part of the country. *Kalmia latifolia* is the largest and most important species of the genus and in favorable situations on the southern Appalachian Mountains sometimes grows to the size of a small tree. It is one of the most beautiful of hardy flowering shrubs and for the northern states the most valuable of the broad-leaved evergreens which can be successfully grown here in the open ground. It would be astonishing that it has been so neglected in this country as a garden plant were it not for the fact that it has never been greatly appreciated or largely planted in England, and until recent years England has set the fashion in plants for us; and so because Rhododendrons flourish in many parts of England we have tried to grow them in a climate not really suited to them and have neglected our native Laurel which, less showy perhaps than some of the Rhododendrons, has beauties of its own which no Rhododendron can surpass. No hybrids or varieties of *Kalmia latifolia* have been developed in cultivation probably because little attention has thus far been paid to the cultivation of these plants, and the few varieties which are known have appeared naturally in the woods. There is a form with pure white flowers (var. *alba*), and there is another with deep pink, nearly red flowers and darker green leaves (var. *rubra*). These extreme forms are connected by others with flowers of all shades of pink. There is a distinct form with small leaves and small heads of small flowers (var. *myrtifolia*). This form is a low compact bush and flowers only sparingly. A form with broad obtuse leaves like those of a Rhododendron (var. *obtusata*) was discovered near Pomfret, Connecticut, a few years ago; this is also a shy bloomer. In another form (var. *polypetala*), first found near South Deerfield, Massachusetts, the corolla is deeply divided into narrow lobes. These varieties are all well established in the Arboretum. The Laurels can be easily and quickly reached from the South Street and Walter Street entrances.

The Sheepkill, *Kalmia angustifolia*, is a handsome dwarf shrub with small dark red flowers and, although rarely seen in gardens, well deserves cultivation. Another dwarf species recently discovered on the southern Appalachian Mountains, *K. caroliniana*, promises to be hardy in the Arboretum, but is still growing in the nursery where seeds of it were planted in 1906. Of the other dwarf species those from the north are difficult to cultivate and require special treatment, and the others are not hardy here.

The blooming of the Syringas (Philadelphus) is also an interesting event in the Arboretum where a large collection of these beautiful plants has been assembled. They can be seen in the Shrub Collection and in a large supplementary group on the right-hand side of the Bussey Hill Road,

opposite the Lilac Group. The first of these plants to flower is a new addition to the collection, *P. Schrenkii*, var. *Jackii*, a rather dwarf plant with slender stems and medium-sized flowers discovered in Corea a few years ago by Mr. Jack who brought seeds to the Arboretum. The flowers have already nearly all fallen. The next to open are the flowers of the southern Appalachian *P. hirsutus*. *P. coronarius* is also one of the early-flowering species; this is a native of southeastern Europe and the Caucasus, with extremely fragrant creamy white flowers. It is the Mock Orange of all old-fashioned gardens and the only European species of this genus. There are several varieties of this plant in the collection but none of them are as valuable as the common form, which is still one of the best garden plants in the genus, and are of little interest except as curiosities. Many other species will soon open their flower-buds; among some of the most interesting are *P. inodorus*, with large, solitary, pure white flowers, and one of the most distinct and beautiful plants in the genus although it is little known in gardens; *P. Falconerii*, of unknown origin but probably a native of Japan or China, and *P. maximus*, a probable hybrid between two American species, and the largest of all the Mock Oranges.

In no other genus of woody plants have more astonishing and unexpected results been obtained by the hybridizer. A few years ago the Rocky Mountain *Philadelphus microphyllus* was sent by the Arboretum to Lemoine, the famous French hybridizer; this is a small-growing species, with small leaves, and small, very fragrant flowers. Lemoine crossed it with *P. coronarius* and produced a new race of plants to which the general name of *Philadelphus Lemoinei* has been given. These hybrids are dwarf and compact shrubs with pure white fragrant flowers, usually not as large as those of *P. coronarius*, and small foliage. There are now many named varieties of this race in the Arboretum and some of the most distinct and beautiful of them are Avalanche, Boule d'Argent, Bouquet Blanc, Candélabre, Conquête, Fantasia, Gerbe de Neige, Mantéau d'Hermine, Mont Blanc, Nuée Blanche, Pavillon Blanc, etc. These and several others are beginning to open their flowers, and no more charming group of dwarf hardy shrubs can be seen. *Philadelphus microphyllus* itself blooms later; none of the other species surpasses it in the fragrance of its flowers. With the exception of *P. coronarius*, all the species are found in the southeastern United States, the southern Rocky Mountain region, the northeastern United States, and in eastern Asia. The largest plants are found among the American species which generally produce larger and handsomer flowers, and are better garden plants than the Asiatic species which usually have smaller and less fragrant flowers.

Some of the Cornels or Dogwoods are now conspicuous. The principal group of these plants is at the junction of the Meadow and Bussey Hill Roads, and several species have been freely planted in border shrubberies in different parts of the Arboretum. The most interesting species now in flower are *Cornus rugosa* or *circinata* and *C. sanguinea*. The first, which is a common native shrub, is one of the handsomest of the genus; it has green branchlets, broad, rounded pale green leaves paler and hairy on their lower surface, and conspicuous clusters of creamy white flowers which are followed by beautiful light blue fruits. Like a few other Dogwoods, it is difficult to transplant but once established soon spreads into large masses. There are several individuals in the Cornel collection, and large shapely plants can be seen on the bank just above the group of Sassafras trees on the right-hand side of the Bussey Hill Road, and

below the Benzoin Group. Among the Hickories on the right-hand side of the Valley Road there are also large groups of this plant. *Cornus sanguinea* is a native of southern Europe and southeastern Asia, and is a large shrub with dark red branches, small flat flower clusters and black fruit; it has wide-spreading lower branches clinging close to the ground, and is well suited to grow as a single specimen or to plant on the margins of woods or of a large shrubbery. The habit of this plant can be seen in the large specimen in the Cornel group.

Magnolia glauca, the Sweet Bay of the Atlantic coast swamps, planted on the right-hand side of the Jamaica Plain entrance, is beginning to fill the air with the aromatic fragrance of its creamy white flowers. This is a shrub or small tree, with handsome leaves bright green and very lustrous above but silvery white below, which remain on the branches until the beginning of winter, and small cup-shaped flowers; it is the last of the Magnolias to flower, and the flowers open during several weeks. *Magnolia glauca* is perfectly hardy; it is easily cultivated and it is one of the most beautiful of the small trees which can be successfully grown in this part of the United States. It is astonishing therefore that it is so little known by the present generation and that good plants in quantity cannot be found in any American nursery.

Two plants of a rare Apple-tree (*Malus florentina* or *crataegifolia*) of the northern Apennines are just passing out of flower in the Apple Group at the eastern base of Peter's Hill where they have flowered more profusely this year than they have before in the Arboretum. It is a small tree with much-lobed leaves like those of the European Hawthorn, small white flowers, and small bright red fruits. Of all the Apples planted in the Arboretum it is the last to flower.

The different forms of the climbing *Evonymus radicans* are flowering very freely this year and can be seen in the Evonymus Group on the right-hand side of the Meadow Road. The hardiest, handsomest and most desirable of all the forms of this useful plant which have been tried in the Arboretum is the broad-leaved variety from northern Japan (var. *vegetus*) which, although it has been cultivated in the Arboretum for the last twenty-five years, is still little known and difficult to find in nurseries.

Opposite the Evonymus Group the Smoke-tree (*Cotinus*) of old-fashioned gardens is in bloom. The flowers are not conspicuous, and it is the clusters of the lengthening hairy colored stems of the flowers which make the "smoke" and the conspicuous feature of this plant which is a native of southern and southeastern Europe, the Himalayas, and western China. Near it is a large plant of the American *Cotinus* which is also in flower. The clusters of hairy flower-stems are less conspicuous than those of its Old World relative, but the foliage is larger, lighter-colored, and in autumn turns brilliantly to orange and scarlet shades. The American Smoke-tree, although it is a native of northern Alabama and southwestern Missouri, is perfectly hardy in New England in the most exposed positions, and is as much at home in western Europe as it is in New England, although usually the trees and shrubs of the southeastern United States do not flourish in Great Britain where they miss the summer and autumn heat necessary to properly ripen their wood.

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BULLETIN NO. 27.

In Bulletin No. 23 something was said of the Chinese *Syringa villosa* and of the hybrids of this plant with the Hungarian *S. Josikaea*, represented by the variety called Lutèce. This variety is just passing out of flower and this year has sustained its reputation of being the handsomest of the late-flowering Lilacs. It is interesting that among the plants of *S. villosa* recently raised at the Arboretum there is one with nearly pure white flowers.

There is a group of Lilacs which bloom even later than Lutèce and its parents; they are not true Lilacs, however, and belong to the section Ligustrina of the genus which differs from the true Lilacs in the short tube of the corolla from which the stamens protrude. There are three species of this group, all natives of northeastern Asia; they are shrubs or small trees, and they produce white, bad-smelling flowers in large clusters. Two of the species are in bloom in the Lilac Group on the left-hand side of the Bussey Hill Road. The earliest of these plants, *S. amurensis*, is not flowering this year; it is a native of eastern Siberia, as its name indicates, and is a small tree with flat, spreading or slightly drooping clusters of white flowers. The second species to flower, *S. pekinensis*, a native of northern China, is a shrub rather than a tree, although it sometimes reaches the height of thirty feet, with numerous stout stems pendant at the ends and covered with bark peeling off in thin layers like that of some of the Birch trees. The long, narrow leaves hang gracefully, and the half-drooping flower-clusters, which are flat and unsymmetrical, are smaller than those of the other species but are produced in great quantities. *S. japonica*, a native of the forests of Japan, is the last of the Tree Lilacs to flower and is a tree often thirty or forty feet high, with a tall, stout trunk covered with lustrous bark like that of a Cherry tree, and a wide, round-topped head. The leaves are large, thick and dark green, and the flowers are produced in large, erect, symmetrical clusters. Like the other species of this group, *S. japonica* loses its leaves early in the autumn without change of color. *S. amurensis* and *S. pekinensis* have not become common in gardens, but *S. japonica* has been quite generally planted in those of the eastern states. It is one of the most valuable plants introduced by the Arboretum where it was first raised from seeds sent in 1876 by the late William S. Clark, the first President of the Massachusetts Agricultural College, and later the first President of the Agricultural College at Sapporo in Japan where this tree is common. One of the first seedlings raised at the Arboretum can be seen in the Apple Group on the right-hand side of the Forest Hills Road going toward the Forest Hills Gate, the site of the first Arboretum Nursery in which this Lilac was planted.

It is unfortunate that it is almost impossible to keep the Locust tree (*Robinia Pseudoacacia*) alive in eastern Massachusetts for any length of time owing to the borer which riddles the trunk and branches of this beautiful and valuable tree. There is now living in the Arboretum only one of the ornamental seedling forms of this tree which are so highly prized and so often planted in Europe, especially in Germany, but it is interesting that this is one of the most abnormal of these forms (var. *monophylla*) in which the compound leaves are reduced to a single leaflet. This variety is spreading rapidly on the bank on the right-hand side of

the Meadow Road beyond the Horsechestnut Group where it is flowering profusely this year and seems able to resist the borer. One of the most interesting Locusts in the collection is a hybrid (*Robinia Holdtii*) between *R. Pseudoacacia* and the Rocky Mountain *R. neo-mexicana* which appeared in a Colorado nursery a few years ago. This is a vigorous tree with pale pink flowers and seems better able to resist the borer than either of its parents. The shrubby Rose Acacia (*R. hispida*) is less often attacked by borers and when in flower it is a beautiful and conspicuous plant. It is, however, sometimes troublesome as it spreads rapidly by underground shoots and so may occupy too much space. Another shrubby Robinia, *R. Kelseyi*, from the southern Appalachian Mountain Region where it was discovered a few years ago, flowers well in the Arboretum and is a desirable and handsome plant. The other arborescent species, *R. viscosa*, the Clammy Locust, and *R. neo-mexicana* suffer badly from the attacks of the borer.

The first of the shrubby Hydrangeas to bloom, *Hydrangea Bretschneideri*, is now in flower. It is a large and very hardy shrub from Manchuria and northern China, and in this climate is one of the most satisfactory plants in the genus. It can be seen in the Shrub Collection, and with it is now flowering for the first time in the Arboretum a variety of the species (var. *setchuenensis*) discovered by Wilson in western China.

Indigofera Kirilowii, a low shrub from Manchuria and Korea, with racemes of pea-shaped pink flowers, is blooming in the Shrub Collection and on Hickory Path, near Centre Street, and is a hardy and handsome garden plant although little known in the United States. Another charming plant of the Pea Family, *Sophora viciifolia*, has been flowering also on Hemlock Path. This is a shrub two to four feet high with small pinnate leaves and showy blue and white flowers. It is a native of central and western China and appears to be perfectly at home in the Arboretum.

Clematis tangutica, which can be found on one of the trellises on the east side of the Shrub Collection, is beginning to open its flowers and will continue to open them for several weeks; they are vase-shaped and bright clear yellow, and as they fade are succeeded by heads of fruits with long glistening hairy tails. As the flowers open gradually during several weeks flowers and fruits appear on the plant at the same time. This Clematis is a native of the extreme western part of China and is one of the best of the hardy vines of recent introduction.

The flame-colored Azalea (*Rhododendron calendulaceum*) has been largely planted on the long slope below Azalea Path and in many of the Arboretum shrubberies, and, although it usually flowers abundantly, this year it has been exceptionally beautiful. Among the seedlings raised at the Arboretum there are plants with flowers of many shades of yellow and orange. Flowering rather later is another *Rhododendron* of the same region *R. arborescens*; the flowers of this shrub are pure white with bright red filaments and, if they are not so showy as those of the flame-colored Azalea, they are equally beautiful and much more fragrant. There are masses of this Azalea on each side of the Valley Road. The flowers of *R. arborescens* will be followed early in July by those of the Clammy Azalea (*R. viscosum*), a common plant in New England swamps, especially in those near the coast, which at midsummer are made fragrant by its pure white flowers. For three months the different Azaleas of the eastern United States flower in succession

in the Arboretum, and among them are plants as beautiful when in flower as any of the hybrid Azaleas produced in Europe. They are hardier and longer-lived than any of the European hybrids or the species of eastern Asia, and among the many shrubs which eastern North America has contributed to gardens none are more beautiful than these six Azaleas, or Rhododendrons as botanists now call them, which are named in the order of their flowering: *Vaseyi*, *canescens*, *nudiflorum*, *calendulaceum*, *arborescens*, and *viscosum*.

Much of the June beauty of the Arboretum is due to the general use in its plantations of several common native shrubs with handsome flowers and fruits. Thirty years ago most of our native shrubs were unknown to gardeners, but the Arboretum has lost no opportunity to teach the lesson that the best trees and shrubs for the permanent decoration of American parks and gardens are to be found in American fields and forests. Now, therefore, it is a satisfaction to know that the appreciation of the beauty and value of many of our native shrubs is gradually spreading from the Arboretum over the country and that it is now possible to find many of the best American trees and shrubs of eastern America in large quantities in several American nurseries.

One of the best of the native plants which have proved satisfactory in the Arboretum is *Cornus racemosa* or, as it is often called, *paniculata* or *candidissima*; this is a common inhabitant of roadsides and wood borders in this part of the country, and in cultivation it is one of the most free-flowering of all the Dogwoods. It is a round-headed shrub with slender erect gray stems which spread into dense broad thickets, and creamy white flowers produced in compound oblong clusters. The plant moreover is as beautiful in October as it is in June for the flowers are followed by translucent white berries borne on bright red stalks, making this one of the most interesting of the shrubs which ripen their fruit in mid-autumn.

A hybrid of this species with another native Dogwood, *Cornus obliqua*, appeared naturally in the Arboretum several years ago and is known as *Cornus Arnoldiana*. The oldest plants are now ten feet high and nearly as broad, with erect stems, and bear flower-clusters which are larger and handsomer than those of either of its parents. The flowers, however, of this hybrid are its chief beauty for it bears little fruit and therefore in the autumn is less interesting and ornamental than *Cornus racemosa*. The Silky Cornel, *Cornus Amomum*, flowers a little later. It has been much used in the Arboretum but in cultivation is not a satisfactory plant unless it can be given sufficient room for its wide-spreading branches to extend out freely and spread over the ground or over water; for this reason it should be planted as a specimen or on the borders of ponds and streams, for which it is admirably adapted. The purple stems are interesting in winter and the bright blue fruits, which ripen in the autumn, add materially to the attractions of this vigorous native shrub.

The Arboretum will be grateful for any publicity given these Bulletins.

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No. 28

ARNOLD ARBORETUM

HARVARD UNIVERSITY

BULLETIN

OF

POPULAR INFORMATION



JAMAICA PLAIN, MASS.

JUNE 26, 1912

BULLETIN NO. 28.

Among the other American Magnolias in the group on the right hand side of the Jamaica Plain entrance *Magnolia macrophylla* is now in flower. This is a medium-sized tree of the southern states where it is found in sheltered valleys and, although nowhere common, is widely distributed from western North Carolina to Kentucky, Florida, Alabama and Arkansas. No other tree of the northern hemisphere beyond the tropics bears larger leaves or larger flowers, for the former are from twenty to thirty inches long and from nine to ten inches wide, while the creamy white petals of the flower, which are marked with a dark red spot at the base of the inner surface and become reflexed above the middle when the flower opens, are from six to seven inches long and from three to four inches wide, the expanded flower being often a foot in diameter. The beauty of this tree is increased by the silvery white color of the lower surface of the leaves and by its symmetrical habit, with wide-spreading branches forming a broad, round-topped head. *Magnolia macrophylla* is perfectly hardy but it is well to plant it in sheltered positions for the leaves are easily torn by the wind. It is one of the most beautiful of all the Magnolias and one of the most remarkable and interesting trees of eastern North America; it is less commonly seen, however, in northern collections than formerly although its value and beauty appear to be more appreciated in some of the middle states than they are here.

One of the most attractive objects in the Shrub Collection this year is a large plant of *Halimodendron argenteum*, called Salt-tree because it inhabits the saline steppes near the river Irtysh in Siberia. The pale rose-colored, pea-shaped, fragrant flowers, which are produced in great abundance, are borne in short clusters and their delicate beauty is heightened by the light color of the leaves which are clothed with a pale silky down. The plant remains in flower during several weeks. The Salt-tree was introduced into England as early as 1779, but it does not seem to be much known in the United States, for among the rare plants sent to the Arboretum for determination it has come only once. It produces abundant crops of seeds in the Arboretum and it can be raised from cuttings, so there is no reason that it should remain so rare in American gardens.

In the Shrub Collection, near *Halimodendron*, another plant of the Pea Family is in flower; this is *Cytisus nigricans*, a low, slender, hardy shrub from central and southern Europe, with long erect racemes of beautiful yellow flowers, and for this climate one of the best plants of its class. With it are blooming *Genista elata* and the well known *Genista tinctoria* which has destroyed with its fatal gift of beauty so many of the fields of Essex County in this state.

Of the Privets, or Ligustrums, none of the introductions from eastern Asia are more valuable garden plants than the European *Ligustrum vulgare* which is becoming naturalized in the eastern states; it is a tall, broad, shapely shrub with bluish green leaves and is now covered with its small, erect, terminal clusters of white, bad-smelling flowers. The great value of this plant is not in the flowers but in the lustrous black fruits which decorate it in the late autumn, and in the fact that it retains its leaves in good condition almost until the beginning of winter, making

it one of the most desirable of all the shrubs which are hardy here for the decoration of parks and gardens. This Privet has been much used as a hedge plant for which it is well suited. There are varieties with greenish yellow fruit, with yellow leaves, and with erect branches. Of the Asiatic species *Ligustrum ibota* is perhaps now the best known of the hardy species here; it is a broad shrub sometimes ten feet high, with spreading slightly recurved branches, small, dark green leaves which turn purplish in the autumn, and short, nodding clusters of white flowers which are produced on short lateral branches and which are followed by clusters of small, purplish black fruit covered with a pale bloom and often persistent on the branches until spring. This is a handsome shrub but it has sometimes suffered from the cold of exceptionally severe winters. Equally handsome but of very different habit is its variety *Regelianum*; this is a much lower and denser shrub, with horizontally spreading branches which form a broad, flat-topped head, and larger leaves. As the two plants grow side by side in the Shrub Collection they appear very distinct, but seedlings of the variety are often identical with *L. ibota*. Another species, *L. amurense* from eastern Siberia, has also fruit covered with a bloom like that of *L. ibota*, but the branches terminate with larger flower-clusters, while the lateral flower-bearing branches are often longer than those of *L. ibota*. It is best distinguished, however, by its pyramidal habit, for it is a tall shrub with erect stems which form a narrow head. The Japanese *L. acuminatum* is a broad shrub with the largest flower-clusters near the ends of the stems and lustrous black fruit like that of *L. vulgare*. These Asiatic species are much confused in American nurseries and a number of plants are sold under the name of *L. amurense* which, on account of its hardiness, rapid growth, and erect stems, has been recommended as a hedge plant for regions which are too cold for the so-called California Privet; this is *L. ovalifolium* and is not a Californian but a Chinese plant. It has been much planted for hedges which in severe winters are often killed to the ground even in southern New England.

The earliest of the Hawthorns, the European *Crataegus nigra*, and the New England *C. Arnoldiana*, were in bloom on the 10th of May, and the flowers of the latest blooming species in the collection, *C. cordata*, the so-called Washington Thorn, are not yet fully expanded. This native of the southern Appalachian region and of southern Missouri is a slender narrow tree sometimes thirty feet high, with small, shining, nearly triangular leaves, and small, dull white flowers; its greatest beauty is in the autumn when the leaves, which do not fall until late, are bright orange and scarlet, and contrast beautifully with the small, bright scarlet, globose fruits which remain in good condition on the branches until spring. The only objection to this tree is the brittleness of the branches which are often split or broken by storms.

Among the fifty species or forms of *Viburnum* found to be hardy in the Arboretum the first to flower, *Viburnum alnifolium*, the Hobble Bush or Moosewood, was in bloom during the first week in May, and the flowers of the latest in the collection to open, *Viburnum Canbyi*, will not be fully out for several days, so that the flowering time of the *Viburnums* here extends through two months. *V. Canbyi* is a broad, tall, round-topped shrub with large lustrous leaves, large flat clusters of flowers and bright blue fruit. It is a native of eastern Pennsylvania and northern Delaware, and is nowhere common. It is one of

the native species which is greatly improved by cultivation and splendid large plants can be seen on the right-hand side of the entrance to the Administration Building and on the Meadow Road.

Some of the wild roses have been largely planted along several of the drives and their flowers add much to the interest and beauty of the Arboretum at this time. The flowers of the earliest of the five New England species, *Rosa blanda*, have already gone and the latest to flower, *R. caroliniana*, is not yet in bloom, but the others *R. virginiana* or *lucida*, *R. humilis*, and *R. nitida*, are at their best. The most beautiful of these three roses is perhaps *R. nitida* with its rather dark-colored flowers and short stems covered with bright red prickles. It is always dwarf in habit and is found from Massachusetts to Newfoundland. *R. virginiana*, which is the common rose of the New England seacoast, is a taller plant with thick very lustrous leaves, and flowers which range in color from dark red to pink. There is also a white-flowered form of this plant found in Maine a few years ago. In the Arboretum there are forms with thinner and duller leaves which may be natural hybrids with *R. humilis* which is the common Wild Rose of the interior, that is of regions beyond the immediate influence of the sea. This is a low plant with dull leaves, and the least ornamental of the native Roses. This Rose or some of its numerous hybrids are generally sold in nurseries for *R. virginiana*. The wild roses flower at the same time as *Cornus rugosa* mentioned in the last issue of these bulletins, and when this Cornus and these Roses are planted together a beautiful combination of color is obtained.

The first species to flower in the collection, and one of the gems of the genus, *Hypericum Buckleyi*, is just opening its bright yellow flowers in the Shrub Collection where it is now well established. It is a dwarf plant growing here only a few inches high, but spreading into a broad mat which becomes covered with flowers, and these remain in good condition for a long time. *H. Buckleyi* is very rare in cultivation, although it is well suited for a sunny position in the rock garden. Naturally it grows on rocky cliffs in the southern Appalachian region where it is nowhere very abundant.

A few of the fruits of early summer are beginning to be conspicuous in the Arboretum. The most beautiful, perhaps, are the bright keys of *Acer tataricum*, a small Maple tree from southeastern Europe and the adjacent parts of Asia. This is an early flowering, very hardy tree well worth cultivating for the brilliancy of its fruit alone. It is a very old inhabitant of the gardens of western Europe and the United States, but since the introduction of the Japanese Maples it has been rather lost sight of. Plants can be seen in the Maple collection. In the Shrub Collection the bright red fruits of a North American Elder, *Sambucus pubens*, are now beautiful and conspicuous, as are those of the rare variety of this plant with orange-colored fruits (var. *leucocarpa*). The fruits of the Old World plants of this group are still green or only just beginning to turn red.

The Arboretum will be grateful for any publicity given these Bulletins.

ARNOLD ARBORETUM

HARVARD UNIVERSITY

BULLETIN

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JAMAICA PLAIN, MASS.

JULY 2, 1912

BULLETIN NO. 29.

The black-fruited Elder, *Sambucus canadensis*, which is the last of the New England shrubs making a conspicuous show of flowers, now adds much beauty to the Arboretum where it is common in the neighborhood of the small ponds near the junction of the Meadow and the Forest Hills Roads and in the valley of the Bussey Brook. In the Shrub Collection are some interesting forms of this beautiful plant. The most conspicuous perhaps is the variety with finely divided leaflets, var. *acutiloba*; another variety, var. *chlorocarpa*, with yellow-green fruit, was found recently in southern New Hampshire. The variety *maxima*, which originated in a European garden, produces flower-clusters at least three times as large as those found on the wild plants, and these are followed by such large and heavy bunches of fruit that the branches are hardly able to support them. The European *Sambucus nigra* and its variety with yellow leaves is also in flower. As a foliage plant one of the most beautiful of all the Elders is the Japanese form of the red-fruited *Sambucus racemosa* (var. *Sieboldii*) which is well established in the Shrub Collection. The flower and fruit clusters are smaller, however, than those of the European and Siberian forms of this plant and the fruit ripens rather later.

The Chinquapin, *Castanea pumila*, is in flower about a week before the flowers of the northern Chestnut-tree appear. The Chinquapin is a native of the coast region of the Atlantic States from New Jersey to Florida. It is found also in the Gulf States and in the region west of the Mississippi River from southern Missouri to Texas. In the Atlantic States it is usually rather a low shrub spreading into thickets, but west of the Mississippi, especially in southern Arkansas and Texas, it grows into a large, round-headed tree, although it never becomes as large as the northern Chestnut-tree. A tree of this western form, and a large group of the dwarf form originally from Virginia are established in the Arboretum and can be seen with the other Chestnuts on the right-hand side of the Valley Road just beyond the Hickory Group. The nuts of the Chinquapin are produced freely in the Arboretum every year and, unlike those of the northern Chestnut-tree, they are cylindrical, not flattened, as only one nut is produced in a burr, and are bright and shining and of even better flavor than those of the common Chestnut. The silvery under surface of the leaves, which is covered with fine hairs, also distinguishes the Chinquapin from the Chestnut-tree.

Attention was called in a recent issue of these bulletins to the value of the eastern Siberian *Hydrangea Bretschneideri* as a garden plant. It is the first of the genus to flower here. More conspicuous is *Hydrangea paniculata* of Japan and western China. The most generally planted of the forms of this plant is one in which all the flowers are sterile, known as *Hydrangea paniculata grandiflora*. This plant produces large clusters of white sterile flowers which turn rose color in fading, and it will not be in bloom for several weeks. There are two other forms in which some of the flowers only are sterile and are called ray flowers because they surround the clusters of fertile flowers. These are the wild plants from which the form *grandiflora*, with all the flowers sterile, has been developed. There are two forms of this *Hydrangea* with perfect flowers and one of these (var. *praecox*) will be in flower in a few days

while the other form, the type of the species, will not be in flower for several weeks. In the Shrub Collection are three plants of var. *praecox*, differing in the size of the flower-clusters and in the size and shape of the ray flowers. The handsomest of these was raised from seeds collected by Professor Sargent in Hokkaido where it grows into a small tree sometimes twenty or thirty feet tall. A variety of the American *Hydrangea arborescens*, known as *grandiflora*, is in bloom. This plant was found a few years ago growing wild in one of the western states and has been largely distributed in this country and Europe. It is a hardy, shapely shrub and produces large clusters of sterile white flowers in profusion. It blooms a few days before *Hydrangea arborescens* itself which is growing with it. Two other American species of *Hydrangea*, *H. cinerea* and *H. radiata*, will soon be in bloom; as a foliage plant the latter is the most beautiful of the American species for the leaves, which are dark blue-green on the upper surface, are silvery white below.

Zenobia is a genus of the Heath Family, by some botanists treated as a section of *Andromeda*, composed of a single species which inhabits pine barrens from North Carolina to Florida, and is a deciduous-leaved shrub from two to four feet in height. The flowers, which are pure white and from one-third to one-half an inch long and broad, are produced in compact clusters arranged along leafless branches of the previous year and are perhaps more beautiful than those of any of the *Andromeda*-like plants. There are two forms, the type, *Zenobia pulverulenta*, with chalky white leaves covered with a dense white bloom, and the variety *nitida* with green leaves. Although natives of a region which produces few plants able to survive the cold of New England, these *Zenobias* are perfectly hardy in the Arboretum and can now be seen in flower in the Shrub Collection and on the right-hand side of Hemlock Hill Road where there is a large group of them in which the green-leaved form is the most numerous. Another deciduous-leaved plant of the same family, *Pieris* or *Andromeda mariana*, also produces its flowers on leafless branches of the previous year, but the flowers are smaller and the plant is less attractive in habit than the *Zenobias*. It is a native of the coast region from Rhode Island southward, and is very abundant on some parts of Long Island. There is a large group of this shrub now in flower on the right-hand side of the Meadow Road in front of the Horsechestnuts.

The common Thyme (*Thymus vulgaris*), one of the old-fashioned fragrant pot herbs and a native of southern Europe, is now not often seen in American gardens; it is a dwarf shrub growing in the Arboretum only a few inches high but spreading rapidly into broad mats which are now completely covered with short clusters of purplish blue two-lipped flowers. Masses of this plant can be seen in the Shrub Collection and on Azalea Path.

Among the climbing Honeysuckles on the north trellis of the Shrub Collection *Lonicera Heckrottii* is exceptionally beautiful this year. This is believed to be a hybrid, probably of American origin, although its history cannot be traced, between the scarlet-flowered American *Lonicera sempervirens* and *L. italica* supposed to be itself a natural hybrid between *L. Caprifolium* and *L. etrusca*, which, though growing naturally only near Lyons in France and near Trieste in Austria, is common in cultivation. The flowers of *L. Heckrottii*, although not fragrant, are very beautiful; the outer surface of the corolla is deep rose color and the inner surface is pale yellow, closed buds and open flowers occurring together in the same cluster and making a beautiful contrast of color.

The leaves of many of the climbing Honeysuckles are often disfigured by attacks of an aphid and can only be kept in good condition by careful spraying early in the season and just as the leaves are unfolding.

The Bush Honeysuckles are now the handsomest plants in the Arboretum with ripe fruits. They produce fruit in great quantities and it remains in good condition for several weeks, and as the different species ripen their fruit from now until October the second period of their beauty is a long one. On different species and hybrids there are blue, black, orange, yellow, crimson and scarlet fruits, and these beautiful and abundant fruits following beautiful flowers make some of the Bush Honeysuckles extremely desirable garden plants especially in the northern United States where they are very hardy and where they appear to fruit more freely than in other parts of the world. The orange-yellow translucent fruit of *Lonicera minutiflora* is one of the most beautiful perhaps in the collection. This plant is a hybrid between the Tartarian Honeysuckle from central Asia and a species from eastern Siberia, *L. Morrowii*. *L. muscaviensis*, another hybrid, is covered with large and translucent scarlet fruit. The fruit of the Tartarian Honeysuckles on some plants is red and on others bright yellow. Two hybrids of this species, *L. bella* and *L. notha*, bear crimson fruit. *L. xylosteum* bears large, dark crimson, lustrous fruit, and a hybrid of it, *L. xylosteoides*, large red fruit. All the numerous forms of *L. coerulea*, a species which is found in all the colder parts of the northern hemisphere, have bright blue fruit, and that of *L. orientalis* is black and lustrous. No group of shrubs in the Arboretum is more worthy of the careful attention of persons who desire to form collections of large, fast-growing, hardy shrubs beautiful when covered in early spring with innumerable flowers or in early summer when their showy fruits are ripe.

The fruit of *Eleagnus longipes* is now ripe and will continue to remain on the plants for several weeks. This hardy Japanese shrub flowers and fruits here profusely. The fruit hangs gracefully on long slender stems and is oblong, nearly three-quarters of an inch in length, scarlet, lustrous and covered with small white dots. It has a tart and rather agreeable flavor, and is sometimes used in cooking. Specimens of this plant can be seen on the right-hand side of the Bussey Hill Road above the Lilacs in the Eleagnus Group.

An illustrated guide to the Arboretum containing a map showing the position of the different groups of plants has recently been published. It will be found useful to persons unfamiliar with the position of the different groups of plants. Copies of this guide can be obtained at the Administration Building in the Arboretum, from the Secretary of the Massachusetts Horticultural Society, 300 Massachusetts Avenue, Boston, from The Houghton, Mifflin Company, 4 Park Street, Boston, at the Old Corner Bookstore, Bromfield Street, Boston, and at the office of the Harvard Alumni Bulletin, 50 State Street, Boston. Price, 30 cents.

The Arboretum will be grateful for any publicity given these Bulletins.

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JAMAICA PLAIN, MASS.

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The largest genus of summer-flowering trees here is *Tilia*, the Lindens, which are now at the height of their flowering time although the flowers of a few of the species are already fading and those of some others are just opening. The genus is widely and generally distributed in all the temperate parts of the northern hemisphere with the exception of western North America and the Himalayas. Between forty and fifty species and several hybrids are recognized, for hybrids and supposed hybrids in *Tilia* are common, and among these hybrids are some of the handsomest and most rapid-growing of all Lindens. Although Lindens are much planted for the embellishment of parks and as street trees there is great confusion, especially in the United States, in regard to the different forms which are cultivated, and this confusion in so far as it relates to the European species was imported from Europe with the trees, for Linnaeus and many botanists after him believed that the Lindens of northern and western Europe were only forms of one tree, and so started the trouble.

In eastern North America there are seven species of Linden trees; four of these are from the extreme south and either are not hardy in the Arboretum or have been tried here during such a short time that they need not now be considered. The Linden of the north, *T. americana*, is a splendid great tree growing to its largest size on rich hillsides and moist bottom-lands, and showing its greatest beauty in the forests of New Brunswick, northern New England, and the valley of the St. Lawrence River. This tree may be easily distinguished from the other Lindens by the green and shining lower surface of the leaves which has no hairy covering with the exception of rather conspicuous tufts in the axils of the principal veins. This tree has been somewhat planted in eastern Massachusetts but less frequently than in the neighborhood of more northern cities. Here, especially in dry summers, the leaves are sometimes made brown by the red spider which, however, is easily controlled by spraying. *Tilia spectabilis*, which is believed to be a hybrid between this tree and *Tilia tomentosa* of eastern Europe, is a very vigorous and fast-growing tree of much promise. In some European nurseries it is sold under the name of *Tilia Moltki*. *Tilia flavescens*, usually found in nurseries under the name of *T. floribunda*, is a supposed hybrid between *T. americana* and the European *T. cordata*. This tree is remarkable in its rather small, thick and very lustrous leaves, and large flowers. Plants only a few feet high flower profusely.

The second North American Linden tree, *T. alba*, or, as it is often called, *T. Michauxii*, although it was first distinguished and made known nearly a century ago, was long overlooked or misunderstood by botanists; and it is only in recent years that this handsome tree has been found to be widely distributed from the valley of the St. Lawrence River to Georgia and Arkansas. It may be distinguished from *T. americana* by the pale lower surface of the leaves, which is more or less covered with star-shaped clusters of white hairs. This tree is now well established in the Arboretum, although the plants are not old enough to flower.

The third of our northern Lindens, *T. heterophylla*, is a species of the Appalachian Mountains and is distributed from western New York to northern Alabama, and through Kentucky to southern Indiana and Illinois, growing to its greatest beauty and to its largest size in the forests which cover the slopes of the mountains of North Carolina and Tennessee.

The leaves of this tree are larger than those of the other Lindens, and as they are silvery white on the lower surface and hang on long slender stalks the slightest breeze makes them turn first one surface and then the other to the eye. This hardy and beautiful tree appears to be rarely cultivated.

All the European Lindens succeed in the eastern states where they have been more generally planted than the American species and where there are large and old specimens of some of the species in the neighborhood of the seaboard cities. There are five European Lindens and it is among these and their hybrids that exists the greatest confusion in the minds of the cultivators of these trees. Probably the most widely distributed of the European species, especially in the south, is *Tilia platyphyllos*. This tree may be recognized by the yellow tinge of the leaves and the thick covering of short hairs on their lower surface and on their stalks, and by the prominent ribs of the fruit. This is the earliest of all Linden trees to flower here, the flowers having been fading for the last ten days, and it is this tree which now appears to be most commonly sold in American nurseries as the European Linden. There are varieties with leaves larger than those of the type (var. *grandifolia*), with erect branches forming a broad pyramidal head (var. *pyramidata*), and with variously divided leaves (var. *lanceolata* and *vitifolia*).

A more beautiful tree is *Tilia cordata*, the common Linden of northern Europe where it sometimes grows to a very large size, the old historic Lindens of the northern and central parts of the continent being usually of this species. This tree is distinguished by its small, thin, more or less heart-shaped leaves which are pale on the lower surface and furnished with conspicuous tufts of rusty brown hairs in the axils of the principal veins. It appears to have been little planted in the United States, and in the neighborhood of Boston it is the rarest of the Lindens of western Europe. It is, however, a hardy and desirable tree especially valuable on account of its late flowers which supply the bees with food after those of all other Lindens have passed. There is a large-leaved form of this tree (var. *cordifolia*) from western Europe in the collection which is a handsome and vigorous plant of much promise. This is sometimes sold in European nurseries as *T. europaea* or *vulgaris*.

The third European Linden, called variously *T. vulgaris*, *T. europaea*, *T. intermedia* and *T. hybrida*, is considered by some of the best observers of European trees a natural hybrid between *T. platyphyllos* and *T. cordata*. Although widely distributed in Europe, it appears to be much less common than either of its supposed parents, and the variation in the size, shape and color of the leaves make its hybrid origin possible. On some individuals the lower surface of the leaves is quite green and on others it is bluish or even whitish, but leaves on different parts of the same branch differ in this respect and on shoots produced from the bases of old trees the large leaves are quite green. *T. vulgaris* is a fine round-headed tree with rather small somewhat pendulous branches, and it appears to have been more often planted in the neighborhood of Boston than any other Linden. There are a number of large specimens in front of an old house on Centre Street near Orchard Street, Jamaica Plain, and in Olmsted Park. The flowers of this tree are now fading, so in its flowering time it is intermediate between its two supposed parents. There is another supposed hybrid of the same parentage and a native of Hungary, known as *T. vulgaris* var. *pallida*. This tree has larger leaves pale on the lower surface, and in habit and general appearance resembles *T. platyphyllos* more than the commoner forms of

T. vulgaris. It is propagated in some of the Dutch nurseries where it is sold as *T. vulgaris* or *europaea*, and in the Arboretum collection it is the most rapid growing and the most shapely of all the species and hybrids, giving promise of becoming an excellent street tree for this region.

Two Linden trees are found only in eastern Europe, the silver Linden, *T. tomentosa* or *argentea*, as it is sometimes called, and *T. petiolaris*. The Silver Linden is a tree with erect branches forming a broad, compact, round-topped formal head, and large erect leaves dark green and lustrous above and white and covered below with short thick felt. This distinct and handsome tree has not been much planted in eastern Massachusetts but it can be often seen in the neighborhood of New York and Philadelphia, and there are a number of good specimens in Central and Prospect Parks. *T. petiolaris* is a more beautiful tree; this also has leaves which are silvery white on the lower surface but they hang down on long slender stalks and flutter gracefully in the breeze. The branches, which are also pendulous, form a rather narrow but open head. This tree is not known in a wild state and all the plants in cultivation have been derived from a single individual found ninety years ago in a garden in Odessa. This beautiful tree appears to have been more often planted near Boston than the Silver Linden, but is still rare and little known here. A supposed hybrid of this tree with *T. americana* and sometimes sold in nurseries as *T. alba spectabilis* is one of the most rapid-growing of the Lindens and a very handsome tree with the leaves of the size and shape of its American parent but silvery white on their lower surface. Plants raised at the Arboretum from the seeds of a tree of *T. petiolaris* which was growing in the neighborhood of *T. Americana*, the two flowering at the same time, are identical with trees of this hybrid found in European nurseries. *T. vestita* is probably the proper name for it.

Much attention in late years has been paid in Europe to another supposed hybrid Linden, *T. euchlora*, or as it is more generally known, *T. dasystyla*. This is a pyramidal tree, with large dark green leaves lustrous on their upper surface. It grows rapidly; its habit is good, and it is now largely planted as a street tree in Germany and Holland. Its origin is uncertain although usually considered a hybrid of the little known *T. rubra* of the Caucasus. *T. euchlora* is perfectly hardy here and promises to be a useful tree in New England.

As a rule the trees of eastern Asia grow much better in the eastern United States than the related species of Europe, but this is not true of the Lindens. All the European Lindens flourish here but none of the Asiatic species give much promise yet of being handsome or valuable trees in this climate. Those which have been tried here are hardy but they suffer from various fungal diseases and are short-lived. It is too soon, of course, to form an opinion on the value of the Lindens recently discovered in western China, but of those of eastern Siberia, northern China and Japan only *T. japonica* has proved really satisfactory here. This is a small tree with pendulous branches, related to *T. cordata*, of which it has sometimes been considered a variety. It has no special ornamental value, although it is perfectly hardy and healthy and flowers and produces fruit in the Arboretum every year.

The Arboretum will be grateful for any publicity given these Bulletins.

No. 31

ARNOLD ARBORETUM

HARVARD UNIVERSITY

BULLETIN

OF

POPULAR INFORMATION



JAMAICA PLAIN, MASS.

JULY 17, 1912

BULLETIN NO. 31.

A few interesting trees flower in the Arboretum after the middle of summer. The first of these is already in bloom. This is the Chinese *Koelreuteria paniculata*, a small tree with large, handsome, pinnate leaves and large erect clusters of bright yellow flowers which are followed by conspicuous bladder-like fruits. No other tree has flowers of a more beautiful yellow color, and no other summer-blooming tree here is so conspicuous when it flowers. *Koelreuteria* is much cultivated in the gardens of Peking, and in western China it is common in hot dry valleys. It is therefore well suited to withstand heat and drought as well as cold. It can be seen on the right-hand side of the Meadow Road between the Evonymus and Horsechestnut groups, its relationship being with the Horsechestnuts and with the Maples.

Another Chinese tree will soon be in flower. This is *Sophora japonica*, a member of the Pea Family, with green branchlets, very dark green pinnate leaves and narrow erect clusters of creamy white flowers. The very large and old individuals of this tree with dark, deeply-furrowed bark which are growing in Peking look at a little distance like Oak trees. First known by Europeans in Japan it was called, like some other Chinese plants, *japonica*, although it was brought from China to Japan with many other plants cultivated by the Japanese and is not a native of the Island Empire. There is a form of this tree with weeping branches which rarely flowers. These trees can be seen on the right-hand side of the Bussey Hill Road opposite the head of the Lilac Group. There is also a fine specimen of *Sophora japonica* in the Public Garden of Boston.

Next to the Sophoras there is a group of the eastern Siberian *Maackia amurensis*, which is now in flower. This is a small tree and the only representative of its genus related to the eastern American and Chinese Cladrastis or Yellowwood. *Maackia*, however, has reddish bark, much smaller leaves, short erect spikes of creamy white inconspicuous flowers and scaly buds. Of much interest botanically, *Maackia* is of little ornamental value and probably will never be very often seen in this country outside of botanical collections.

Much more conspicuous and an object of great interest always to visitors to the Arboretum is *Acanthopanax ricinifolium*. This member of the Aralia Family is not an uncommon inhabitant of the forests of the northern island of Japan and grows also in Korea; it is a large tree with dark deeply furrowed bark, stout spreading branches which, however, are nearly erect on young trees and more or less armed like the trunk with short stout spines, and large, palmately lobed dark green leaves drooping on long stalks. In size and shape the leaves resemble those of the Castor-oil plant, *Ricinus*, a fact to which this tree owes its specific name. The small white flowers are produced in broad, flat, compound clusters and are followed in the autumn by shining black, berry-like fruits. *Acanthopanax ricinifolium* was raised at the Arboretum from seeds brought from Japan in 1892 by Professor Sargent; it has grown here rapidly and is perfectly hardy. There are two plants in the Aralia Group by the pond at the junction of the Meadow and Bussey Hill Roads, and there is a plant beyond the Platanus Group at the Centre Street entrance, and another in the mixed plantation on Peter's Hill.

Two other trees of the Aralia Family are also still to flower. These are the Hercules' Club, *Aralia spinosa* of the southern states, and its

near relative from eastern Siberia, *Aralia mandshurica*, still sometimes found in nurseries under the name of *Dimorphanthus*. The Hercules' Club grows sometimes thirty feet high, with a slender stem armed like the branches with stout prickles. The leaves are twice pinnate, from three to four feet long, and two and a half feet wide, and the small white flowers are borne on long slender stems in many-flowered clusters arranged in broad twice compound panicles three or four feet in length, rising singly or in pairs above the spreading leaves. The flowers are followed by great clusters of small black fruits which ripen in the early autumn. No other tree of temperate North America has such a tropical aspect as this *Aralia*, which is not always entirely hardy in New England although it is now well established at the northern base of Hemlock Hill, just back of the Laurels, where it has spread by suckers from the roots. Its Manchurian relative, which greatly resembles the American tree, is hardier here and can be seen in the border between the drive and walk next to the Liquidambers and in the *Aralia* Group.

Another North American tree, the sorrel-tree or Sourwood, *Oxydendrum arboreum*, is now covered with flower-buds. This beautiful and interesting tree belongs to the Heath Family and is the only representative of its genus. On the rich slopes of the southern Appalachian Mountains it sometimes rises to a height of thirty feet or more, although in cultivation at the north it begins to flower when only a few feet high and will probably never become a large tree. The leaves are oblong, bright green and very lustrous, and have a pleasant acidulous flavor to which this tree owes its common names. The white flowers, which are shaped like those of the Andromedas, are erect on the branches of a terminal, spreading or slightly drooping, compound cluster seven or eight inches long; they retain their beauty for a long time and are followed by capsular fruits. The leaves of this tree turn in the autumn bright scarlet. The Sorrel-tree appears to be free from the attacks of all insects; it does not suffer from disease, and it is surprising that such a handsome, hardy and interesting tree should be so little known. There are a number of individuals among the Laurels at the northern base of Hemlock Hill.

With the early flowering Japanese forms of *Hydrangea paniculata* (var. *praecox*) mentioned in a recent Bulletin, *Aesculus parviflora* is now the most conspicuous shrub in flower in the Arboretum. This native of the southeastern United States is the last of the Horsechestnuts to flower. It is a shrub which in cultivation sometimes spreads to a diameter of twenty feet or more but rarely attains a greater height than six or eight feet. It is a good plant to use as a single specimen as it is perfectly symmetrical in habit, or, as has been done in the Arboretum, it can be planted in masses. The plants are now covered with long narrow spikes of small creamy white flowers which stand erect above the dark green foliage. A group of this Horsechestnut can be seen with the other Horsechestnuts on the right-hand side of the Meadow Road at the base of the woody hill which rises at the southwestern extremity of the north meadow.

The Pepperbush, *Clethra alnifolia*, will soon open its fragrant white flowers which are borne in erect, terminal, compound clusters. This is perhaps the most beautiful of the summer flowering shrubs of New England and is a common inhabitant of swamp borders and other wet places in the neighborhood of the coast from Maine to Florida. The Pepperbush can be seen along the Meadow Road where it has been largely planted, and in the Shrub Collection. A form with flowers faintly

tinged with rose was found near Fall River, Massachusetts, a few years ago and has been introduced into the Arboretum. Another species, a native of Florida, *C. tomentosa*, has proved hardy in the Arboretum, and is valuable as it flowers two or three weeks later than the northern Pepperbush from which it chiefly differs in the covering of white hairs on the lower surface of the leaves. The third American species, *C. acuminata*, an inhabitant of the forests of the southern Appalachian Mountains, has dull green leaves and drooping clusters of yellowish white flowers, and is a much less desirable garden plant. It can be seen with the others in the Shrub Collection and on the right-hand side of the Meadow Road near the Phellodendron Group. The Japanese species, *C. canescens*, lives in the Arboretum but has not proved very hardy here and has not flowered, although it has been more successful in other Massachusetts gardens where it produces freely its beautiful fragrant flowers.

Only a few forms of the large genus *Yucca*, which has its headquarters in the southwestern part of the United States, in Mexico and in Central America, are hardy in the Arboretum where they can be seen in the Shrub Collection. The common *Yucca* of American gardens is *Y. flaccida*, with thin reflexed leaves gradually narrowed from below the middle to the apex and separating on the margins into straight thin threads. In gardens, however, it generally appears under the name of *Y. filamentosa*, a species with thicker and more rigid leaves usually broadest above the middle, and separating on the margins into coarser curled threads. *Y. flaccida* is a native of the southern Appalachian foothill region and is probably the hardiest of all the *Yuccas*. It is now in full flower, as well as the form with leaves striped with yellow (var. *lineata*) which is usually found in gardens under the name of *Y. filamentosa variegata*. A fine and vigorous form of *Y. flaccida* from Stone Mountain, Georgia, (var. *patens*) is also in flower. There are also in the collection the true *Y. filamentosa* of the coast plains of the southeastern United States and its variety *concava*, found from the coast of Maryland southward, and *Yucca glauca*. This last is a plant with narrow leaves and is common and widely distributed over the high plains at the eastern base of the Rocky Mountains from Wyoming southward. This handsome plant is perfectly hardy here but has not flowered in the Arboretum.

Indigofera Kirilowii mentioned in a recent Bulletin has continued to grow and to produce its racemes of bright pink flowers in spite of the drought of June and early July which has been one of the most severe the Arboretum has experienced. This Korean shrub remains a long time in bloom. Its habit and foliage are excellent, and it gives every promise of being a valuable addition to the list of summer flowering shrubs. Two other species of this genus are now flowering on Azalea Path, *I. decora* from China and Japan, with pure white flowers, and *I. Gerardi-ana* with purple flowers, a native of the Himalayas. The low stems of these plants are killed to the ground every winter but new ones appear in the spring and growing rapidly flower freely at this time. *I. decora* is the more beautiful of the two and well worth a place on the margin of any shrubbery or in the herbaceous border.

These Bulletins will now be discontinued until the autumn.

The Arboretum will be grateful for any publicity given these Bulletins.

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No. 32

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JAMAICA PLAIN, MASS.

OCTOBER 17, 1912

BULLETIN NO. 32.

The number of woody plants that produce flowers in New England after the middle of October is not large. The most important of them is, of course, the native Witch Hazel (*Hamamelis virginiana*) which is a true autumn bloomer, that is, it does not begin to flower until after the first of October. Its small clusters of flowers with their long pale yellow strap-shaped petals are now partly hidden by the leaves which are bright yellow and very conspicuous. As the leaves fall the flowers seem to cover the branches and form one of the most interesting features of the autumn flora of the northern United States. Occasionally a plant can be found in flower with leaves still retaining their summer color, and on such plants the beauty of the flowers is increased by the contrast between the bright green leaves and the yellow flowers. There is another species of Witch Hazel in southern Missouri and Arkansas which blooms in early spring, and the two Japanese species and the species of central and western China are also spring bloomers. The Witch Hazel Group, containing besides *Hamamelis*, the Sweet Gum, Liquidambar and Fothergilla, is on the south side of Meadow Road at its junction with the Bussey Hill Road. Large specimens of *Parrotia persica*, a shrub or small tree of this family, can be seen on Hickory Path near Centre Street. This plant grows in the Arboretum into a broad round-headed shrub with erect stems and, as the flowers and fruits are not conspicuous, is chiefly valuable for the orange and scarlet tints assumed in autumn by its ample leaves.

A plant still in flower is *Lonicera Heckrottii*. This is one of the climbing Honeysuckles and is of hybrid origin. It was described in Bulletin No. 29, issued on July 2nd last, when it had already been in flower two or three weeks. From the middle of June until the middle of October it has been covered with flowers. Although not fragrant, they are very beautiful; the outer surface of the corolla is deep rose color and the inner surface is pale yellow, and as closed buds and open flowers appear together in the same cluster beautiful contrasts of color are produced. This vine flowers more constantly and more persistently than any other plant in the Arboretum, and it might well find a place in every New England garden in which beautiful flowers are valued. A few belated flowers are still opening on the climbing semi-evergreen, Hall's Japanese Honeysuckle (*Lonicera japonica Halliana*), and on the still more beautiful Chinese form of the same species, *L. japonica chinensis*, distinguished by the red color of the young stems and leaves. Two eastern American species of climbing Honeysuckles, *L. hirsuta* and *L. prolifera*, are interesting at this time as they are covered with compact clusters of bright red fruits surrounded by the cups formed by the union of the two upper leaves. These climbing Honeysuckles are on the trellis at the north end of the Shrub Collection. The leaves of many of the climbing Honeysuckles are often disfigured by the attacks of an aphid and can only be kept in good condition by careful spraying early in the season and just as the leaves are unfolding.

A few belated flowers are still to be found on the lovely *Daphne cneorum* of the mountains of central Europe. The prostrate stems of this little shrub are covered with light green leaves which persist during the winter and in early spring bear terminal compact clusters of delightfully

fragrant rose-colored flowers. In summer a nearly full second crop of flowers is sometimes produced, and flowers occasionally continue to appear until November. This *Daphne* is one of the most attractive of the evergreen shrubs which can be grown in this climate. It is usually perfectly hardy but sometimes suffers in winter, and as often in mild as in exceptionally severe winters. It is rather capricious, too, in matters of soil and situation, flourishing for years in some gardens and failing in others.

There are flowers, too, on some of the forms of the Heather (*Calluna vulgaris*) in the Shrub Collection, and the Cornish Heath, *Erica vagans*, which has been covered with flowers during the last two months, is still flowering abundantly. This is one of the few Heaths which can be grown in New England. Equally hardy is the red-flowered *Erica carnea* which blooms in early spring and only for a short time. This is a smaller plant than *E. vagans* and a native of the Alps of central Europe; while the Cornish Heath, of which there are both red and white-flowered forms, is rather widely distributed in western Europe.

There are still flowers on the plant of *Vitex incisa* in the Shrub Collection. This is a member of the Verbena Family and a native of northern China and Mongolia. It is a large shrub of open graceful habit, with compound leaves and erect clusters of small bright blue flowers, and is valuable for its good habit, attractive leaves, and late flowers. It is not so showy, however, in flower as the Chaste Tree, *Vitex Agnus-castus*, a native of southern Europe and western Asia which, unfortunately, is not hardy in New England.

Abelia grandiflora is flowering on Hickory Path near Centre Street. *Abelia* is a genus related to the Honeysuckles, of some twenty-five species in eastern Asia and a single representative in Mexico. Several species have been recently introduced into the Arboretum by Wilson from western China and some of these lived through last winter in the open ground. It is too soon, however, to speak of their value here as garden plants; and the only plant of this interesting genus which can now be depended upon here is *A. grandiflora*. This is a hybrid between two Chinese species, *A. chinensis* and *A. uniflora*, and is found in gardens under a number of names. It seems, however, to be most often cultivated as *A. rupestris*. This is the Mexican species which is sometimes grown in greenhouses in this country and in the gardens of southern Europe. *A. grandiflora* is a shrub from two to three feet high with slender arching branches, small pointed leaves dark green and very lustrous on the upper surface and paler on the lower surface, and axillary clusters of small pale pink tubular flowers. The leaves do not fall until the beginning of winter; and their semi-persistent character, the autumnal flowers and excellent habit of this little plant make it a desirable subject for the rock garden or the margins of shrubberies.

It is not, however, the occasional flowers which can be found in the Arboretum in the middle of October which chiefly make it interesting at this time, but the Autumn condition of the trees and shrubs which flower in the spring or summer. Valuable lessons in decorative gardening can now be learnt here, for nowhere else are the colors assumed by the fading leaves of hardy trees and shrubs more varied and interesting; no other part of the world can equal the northeastern United States in the abundance of the fruits produced by these plants, and in New England the most beautiful of all autumn gardens can be made.

The difference between eastern North America and western Europe in the autumn coloring of the native plants of these two regions is now well shown in the Arboretum. The leaves of the plants of eastern North America are now for the most part brilliantly colored or have colored and fallen, while the leaves of the trees and shrubs of Europe are still green, and in the case of many of these plants the leaves fall and wither with little change of color. This interesting fact is seen in the American species of the genus *Fagus*. The American Beech now enlivens the forest with the yellow tints of its leaves, while the leaves of the European Beech are still almost as green as they were at mid-summer. The leaves of the American Elm have already fallen except in the case of vigorous trees which still show the yellow tints of autumn, while the leaves of all forms of European and Asiatic Elms are still fresh and green. The leaves of *Viburnum Lantana*, the Wayfaring-tree of Europe, are still dark green or only slightly tinged with red along the margins, while the North American *Viburnum Lentago*, *V. prunifolium* and *V. cassinoides* are splendid in their autumn dress which is set off by their dark blue fruits. The contrast between old and new world plants in this respect is even more marked in the *Viburnums* of the *Opulus* group. Of these the leaves of the European *Viburnum Opulus* are still dark green and as fresh as in July; those of *V. americanum*, the native High-bush Cranberry, so-called, have turned to shades of yellow and red and are fast falling, while those of *V. Sargentii* of northeastern Asia, which were bright orange-red two weeks ago, have almost disappeared.

Many of the trees and shrubs of eastern Asia, however, are as brilliant in color in autumn as those of related American species. On a few Asiatic plants the autumn foliage is even more beautiful than that of the American plants in the same genus. The collection of grapes (*Vitis*) illustrates this fact. This collection, which is now well established on the trellis at the east end of the Shrub Collection, is one of the most successful groups in the Arboretum, and is particularly valuable in showing the decorative value of many of the grapevines of eastern America which have not before been often cultivated. The autumn leaves of American species turn yellow or remain green until touched by frost, to which they are very sensitive, but on the principal Japanese species, *Vitis Coignetiae*, a large and vigorous vine with immense semicoriaceous leaves, the leaves in the autumn turn brilliant scarlet. They are not always as brilliant here, however, as they are this season for *Vitis Coignetiae* is a plant from the far north and it is possible that the climate of eastern Massachusetts is not severe enough to bring out every year all its autumnal beauty. It is, however, one of the handsomest of the grapevines in the Arboretum collection, and for Canada and other cold regions it may be expected to become the most valuable of hardy vines.

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Attention is called in this Bulletin to a number of plants which are beautiful in the autumn from the brilliant color of their leaves and which are not generally cultivated in New England.

One of the most brilliant of all trees in autumn here is the Liquidamber or Sweet Gum (*Liquidambar Styraciflua*). This eastern American tree grows as far north as southern Connecticut and in the south, especially in the maritime region of the southern Atlantic states, and in the lower Mississippi valley it is one of the commonest of the trees of the forests on the bottom-lands of rivers where it sometimes grows to the height of more than one hundred and fifty feet. It is a tree with a tall straight trunk and short branches which form a narrow pyramidal head and are furnished for several years on their upper side with broad corky wings. The flowers and the fruit are not conspicuous, and the great beauty of this tree is found in its habit and in the leaves; these hang on long stalks and are generally rounded in outline with a square or slightly heart-shaped base and are deeply five- to seven-lobed, the lobes being acutely pointed. The leaves are thin and very lustrous on the upper surface and in autumn turn deep crimson. There is a species of Liquidamber in southwestern Asia which produces the Liquidamber of commerce, another in Central America, and two Chinese species. The two Chinese species are both growing in the Arboretum and there is a probability that one of these, *L. formosana*, will prove hardy here. This is the tree which produces much of the wood used for Chinese tea-boxes. There are several individuals of the American Liquidamber in the Arboretum, the two largest specimens being in the Witch Hazel group near the junction of the Meadow and Bussey Hill Roads.

The Sour-wood or Sorrel-tree, *Oxydendrum arboreum*, is another American tree which is too rarely found in cultivation. It is the only representative of the genus which belongs to the Heath Family, and in favorable surroundings on the Appalachian Mountains sometimes becomes fifty or sixty feet tall. It is, however, much smaller in cultivation at the north and begins to flower when only a few feet high. This tree owes its common name to the acid juices of the leaves which protect them from insects and this adds to its value. It is valuable, too, because the white flowers, erect on the drooping branches of large clusters terminal on axillary branches of the year, do not appear until midsummer when few woody plants are in flower and because the leaves in autumn turn bright scarlet in striking contrast to the clusters of white, dry, pointed, capsular fruits. This southern tree is perfectly hardy in New England where it should be more generally planted. There is a group of the Sour-wood among the Laurels at the base of Hemlock Hill.

Better known in this part of the country than the Liquidamber and the Sorrel-tree, the Flowering Dogwood (*Cornus florida*) might well be planted more generally than it has been, for there is no more beautiful inhabitant of the woods of eastern North America. The inflorescence, with its pure white floral bracts which appear before the leaves unfold, lights up the forests in early spring and in the autumn when

the clusters of shining scarlet fruits are ripe and the leaves have turned scarlet no other small tree is more beautiful here.

The leaves of the Scarlet Oak (*Quercus coccinea*) are still green, or are only just beginning to turn, but in a short time this tree will be the most brilliant in color of all the Oaks which can be grown in this region. The Scarlet Oak is comparatively rare in the immediate neighborhood of Boston, but in Plymouth County it is, perhaps, the most common Oak tree, and the autumn splendor of the woods in which this tree abounds will well repay a late October visit to the Old Colony.

The leaves of no other shrub in the Arboretum are now so bright scarlet as those of the common Highbush Blueberry of New England swamps (*Vaccinium corymbosum*). This plant has much to recommend it for general cultivation; the habit is good, the flowers are beautiful, the large bright blue fruits which cover the branches in early summer are very handsome and of better quality than those of any other Blueberry, and the autumn foliage is unsurpassed in brilliancy. Young plants can be easily transplanted from the swamps and succeed in any good garden soil in which they grow rapidly and flower and produce fruit in abundance. The Highbush Blueberry has been largely planted in the Arboretum shrubberies and there is a group of these plants on both sides of Azalea Path at its entrance from the Bussey Hill Road at the base of the Overlook.

Almost as brilliant here as the Highbush Blueberry are the Japanese species of *Enkianthus* which are established on the lower side of Azalea Path. The largest of these, *Enkianthus campanulatus*, is a tall narrow shrub with slender erect stems and drooping clusters of pale, Heath-like flowers. Like the other species its greatest beauty, however, is in the autumn when the leaves turn bright scarlet. This plant and *Enkianthus japonicus*, a much dwarfer species, are found in all Japanese gardens where they are grown for the colors of their autumn foliage. Although perfectly hardy and in every way satisfactory plants, the different species of *Enkianthus* are rarely found in American gardens.

One of the most interesting shrubs in the Arboretum in early autumn is the eastern Asiatic *Evonymus alatus* for, unlike those of any other plant in the collection, the leaves turn a clear rose color. This is a large, wide-screading, rather compact shrub with branches furnished with broad corky ridges and inconspicuous flowers and fruits. Its fine habit and the unusual color of the leaves in autumn are its chief claims for attention. Unfortunately the leaves fall early and their period of beauty is short. There is a large plant in the *Evonymus* group on the right-hand side of the Meadow Road and another on the left-hand side of the Bussey Hill Road above the Lilacs.

Of the shrubs with leaves which turn orange and scarlet in the autumn the most conspicuous now is *Fothergilla major*. *Fothergilla* is a genus related to the Witch Hazels and is found only in the southeastern United States where four species have been distinguished; they bear leaves which generally resemble those of the Witch Hazels and showy terminal heads of small white flowers which appear in spring before the leaves. The largest and the handsomest of the species, *Fothergilla major*, sometimes grows to be ten or twelve feet high, and it is the tallest of the species which is cultivated here. This and the related *Fothergilla monticola* are mountain species and very hardy here. The other species

are smaller plants from the southern coast region and require especial winter care.

Every one in New England interested in gardens knows the brilliant autumn colors of the Japanese *Berberis Thunbergii* which has been much planted here in recent years and is now an extremely popular garden shrub. Some other Asiatic Barberries, although still little known here, are equally beautiful at this season of the year. The dwarf form of *Berberis Thunbergii* (var. *microphylla*), of dwarfer habit and smaller leaves, which originated in the Arboretum several years ago, is an attractive little plant, and a Japanese variety of the species (var. *Maximowiczii*) is a larger plant than the type, with arching stems, larger leaves and larger flowers and fruits. In the autumn the color of the leaves is as beautiful as those of *Berberis Thunbergii*. But probably the handsomest of all the Barberries which are hardy in this climate is the Japanese *Berberis Regelianae*. This is a large shrub with the habit of the common Barberry, but the leaves are larger and more lustrous, the fragrant flowers are larger and of rather a paler shade of yellow, and the fruit is more brilliant; in the autumn the leaves turn orange and scarlet. This Barberry was among the first of the Japanese shrubs brought into American gardens as it was cultivated at the Parsons' Nursery on Long Island fully fifty years ago and was then known and distributed as *Berberis Hakodate*. It appears, however, to be still very rare in the United States and Europe. There is a large clump of this species among the Barberries on Hickory Path near Centre Street.

Another Japanese Barberry, *Berberis Sieboldii*, is well worth a place in every collection for the beauty of its deep dull red autumn foliage. This is a smaller shrub with erect stems forming a round-topped head, large flowers in few-flowered clusters, and large shining fruits.

There is now a large number of new Chinese species of Barberry in the Arboretum but the value of many of these as garden plants here is not known. Two Chinese species, *Berberis diaphana* and *B. dictyophylla* which were discovered a few years ago by French Missionaries who sent them to France whence they reached the Arboretum, are now known to be plants of exceptional value. *Berberis diaphana* is a low round shrub with solitary pale yellow flowers which are followed by large red fruits. The habit of this plant is unusual among Barberries and make it valuable in small shrubberies. Its greatest beauty, however, is in the autumn color of the leaves which is not surpassed in brilliancy by that of any other Barberry. *Berberis dictyophylla* is a tall shrub with slender erect stems which form an open irregular head, small spiny leaves which are light green on the upper surface and silvery white below, large pale yellow flowers solitary or in pairs and red fruit. This shrub is attractive throughout the season and is particularly beautiful in the late autumn when the upper side of the leaves turns scarlet and the lower side retains its silver color, a condition which is found in a few other plants and is always attractive. These Barberries are established in the Shrub Collection and can be found in the supplementary Barberry collection on Hickory Path.

The Arboretum will be grateful for any publicity given these Bulletins.

No. 34

ARNOLD ARBORETUM

HARVARD UNIVERSITY

BULLETIN

OF

POPULAR INFORMATION



JAMAICA PLAIN, MASS.

NOVEMBER 1, 1912

BULLETIN NO. 34.

To the general rule that the leaves of European trees are not brilliantly colored in the autumn in comparison with those of eastern North American and eastern Asiatic trees of the same genera there are a few exceptions. The most conspicuous of these exceptions is perhaps found in the so-called Norway Maple (*Acer platanoides*), a large tree of northern and central Europe which has been much planted in the northern and middle states where it succeeds better than most European trees. This tree almost equals the native Sugar Maple in the bright clear yellow tints of its fading leaves which do not take on their greatest beauty until after those of the Sugar Maple have mostly fallen. This tree is very beautiful, too, in the early spring when the leafless branches are covered with dense clusters of bright yellow flowers. In cultivation a number of seedling forms of this tree have been developed and many of the most important of these are established in the Maple Group. The best known of these horticultural varieties is the form with purple leaves (var. *Schwedleri*) which has been often planted in this country. The leaves of this form are deep reddish purple early in spring, but their color is not persistent and nearly disappears before midsummer, leaving the leaves a dull shade of green. The var. *globosum* is a broad shrub only a few feet high and one of the most valuable of all the dwarf Maples. There is an unusually fine specimen of this form in the collection. The var. *columnare* is a pyramidal tree with erect branches, and the var. *nanum*, sometimes known in gardens as *Acer platanoides pyramidale nanum*, is dwarfer than the last mentioned variety and is an attractive and useful plant for small gardens. There are several forms of this tree with deeply divided or otherwise abnormal leaves. Some of these are var. *laciniatum*, the Eagle-Claw Maple, var. *cucullatum* and var. *palmatum*.

The American Horsechestnuts lose their leaves early and without much change of color, although occasionally those of the Ohio Buckeye (*Aesculus glabra*), when the tree is grown under exceedingly good conditions, turn bright red early in October. The tree from the south of Greece, however, the familiar and common Horsechestnut of parks and gardens and one of the most splendid of all hardy trees holds its leaves later than any of the American species, and on trees grown in damp moist soil they are only now beginning to fall after having turned bright yellow.

The American Lindens have now lost their leaves, but those of one species from western Europe, *Tilia petiolaris*, are only just falling, having first turned bright yellow. This is a handsome tree with rather pendulous branches and leaves which are silvery white on their lower surface and hang on long drooping stalks. This is not a very common tree in the neighborhood of Boston but it was largely planted on many estates in Newport, Rhode Island, from fifty to seventy years ago and some of these Newport trees have grown into beautiful specimens.

The three European Oaks which are usually cultivated in the eastern United States, *Quercus pedunculata*, *Q. sessiliflora*, and *Q. Cerris*, the

Turkey Oak, hold their leaves late and show no bright autumn colors. These three trees grow very rapidly here while they are young but are short-lived as the stems are usually cracked by the cold and, like the European Ash (*Fraxinus excelsior*) and the Sycamore Maple (*Acer Pseudoplatanus*), they are unsatisfactory to plant in New England. One of the Oaks of western Europe, *Quercus conferta*, or, as it is often called, *Q. pannonica*, promises to be a much more valuable tree here. This is a large and common forest tree in some parts of Hungary and is easily distinguished by the leaves which are deeply divided into numerous narrow lobes and which turn bright yellow at this season. It is a perfectly hardy, shapely, fast-growing tree which promises to succeed in this region as it has in western Europe, and it is surprising that it is still so little known and so seldom planted in the United States. The largest plant in this country which has been reported to the Arboretum is growing on what was formerly the estate of George W. Carpenter in Germantown, Pennsylvania, and is now about forty feet high. Mr. Carpenter, who was a lover of trees and had a large collection of them, was a friend of Thomas Nuttall, the distinguished botanist, who paid him frequent visits about 1850 and probably procured this then little known tree for him. There is a fine specimen, too, on the estate of Mr. John T. Morris at Chestnut Hill, Philadelphia, which produces acorns freely, but outside the Arboretum it does not appear to be growing in Massachusetts. The Hungarian Oak may be seen near Oak Path among the other exotic Oaks.

Five eastern Asiatic Oaks are well established in the Arboretum and nearly all of them produce fruit here; they are *Quercus crispula*, *Q. grosseserrata*, and *Q. glandulifera* from Japan, and *Q. dentata* and *Q. variabilis* from China and Japan. They are all interesting and attractive trees, and *Q. grosseserrata* will probably grow here, as it does in Japan, to a large size and become a valuable timber tree. The leaves of these Asiatic Oaks turn yellow or yellow and red in the autumn; they can be seen on Azalea and Oak Paths and on the left-hand side at the foot of Azalea Path where there is a large plantation of Asiatic Oaks. In this collection are the Oaks discovered by Wilson in western China; these are growing well and appear to be perfectly hardy, but it is too soon to speak of their value in this country.

The leaves of nearly all the Sumachs turn scarlet or red in the autumn. The last of them to lose its leaves is the native *Rhus copallina*. This plant at the north is a low shrub which spreads into thickets, but at the south, especially in southern Arkansas and in Texas, it sometimes becomes a slender tree thirty or forty feet high. The leaves are rather more lustrous than those of the other Sumachs, and this species can also be distinguished by the wings on the stalks between the leaflets. Few plants present a more brilliant appearance in the autumn when the leaves turn bright scarlet. In the Sumach group, which is on the east side of the Meadow Road, there is a plant which is of exceptional beauty in the autumn; this is the American Smoke-tree (*Cotinus americanus*). It is a rare tree found only in the south in a few isolated stations from northern Alabama to southwestern Missouri, eastern Oklahoma, and western Texas. In the Arboretum, where it grows

in the form of a large shrub rather than a tree, it is perfectly hardy in the most exposed positions. The flowers are small and the hairy stems of the fruit, which form the conspicuous "smoke" of the Old-World Smoke-tree, do not make much show; but the leaves are large and of a pleasing shade of green, and in the autumn turn orange and scarlet, making this one of the handsomest October plants in the Arboretum. This plant was introduced into cultivation by the Arboretum many years ago from northern Alabama and it is now often cultivated and much valued in Europe where it appears to be better known than in the United States. The bright orange-colored heartwood is very durable and yields an orange dye used in the south during the Civil War when most of the large trees were destroyed.

In the Shrub Collection the leaves of two currants are just turning scarlet. These are *Ribes curvatum* and the Chinese form of *Ribes fasciculatum*. *Ribes curvatum* is a little known plant found a few years ago in the neighborhood of Stone Mountain in central Georgia. It has long white flowers gracefully drooping on long stems and in cultivation has proved to be one of the attractive plants in the large collection of this genus. The beauty of the Chinese Currant at this season is increased by the bright red fruits which are still on the branches. It is the only representative of the genus in the collection with fruit which ripens in the autumn, and is well worth a place in every collection in which handsome autumn fruits are valued.

The Japanese and Chinese Wistaria, *W. sinensis*, is the species which is commonly cultivated in this country. The leaves are usually destroyed by frosts while they are still green, but the leaves of another Chinese species, *W. multijuga* usually turn a brilliant clear yellow before falling. This species, which is less commonly found in American gardens than *W. sinensis*, blooms later than that species and has longer flower clusters on which the flowers are set further apart and are more fragrant. It is a form of this species with abnormally long flower clusters which is so highly valued and so often cultivated by the Japanese. There are forms with pale blue, white and rose tinted flowers. This Chinese vine appears to be hardier than *W. sinensis*.

An illustrated guide to the Arboretum containing a map showing the position of the different groups of plants has recently been published. It will be found useful to persons unfamiliar with the position of the different groups of plants. Copies of this guide can be obtained at the Administration Building in the Arboretum, from the Secretary of the Massachusetts Horticultural Society, 300 Massachusetts Avenue, Boston, from The Houghton, Mifflin Company, 4 Park Street, Boston, at the Old Corner Bookstore, Bromfield Street, Boston, and at the office of the Harvard Alumni Bulletin, 50 State Street, Boston. Price, 30 cents.

The Arboretum will be grateful for any publicity given these Bulletins.

No. 35

ARNOLD ARBORETUM

HARVARD UNIVERSITY

BULLETIN

OF

POPULAR INFORMATION



JAMAICA PLAIN, MASS.

NOVEMBER 7, 1912

BULLETIN NO. 35.

At this season one meets in Tokyo many venders with bunches of leafless branches of a native Holly covered with small red berries, but in this country fruit-covered branches of hardy trees and shrubs are as yet little appreciated for the decoration of houses, although the branches of several of our plants are admirably suited to the purpose. The fruits of many of these retain their beauty for a long time and such decorations are much more economical than those made by the short-lived forced flowers of late autumn and early winter. The branches of the evergreen Holly of the southern states, *Ilex opaca*, however, are much used at Christmas, and occasionally branches of *Ilex verticillata* can be seen here in the windows of enterprising florists.

The Holly sold in the streets of Tokyo is *Ilex serrata*, and the fruit is smaller and less bright-colored than that of the American representatives of this plant, the so-called Black Alders of New England swamps. There are two of these, *Ilex verticillata* and *I. laevigata*; the former is the more common plant, but the latter is showier as the fruit is larger and brighter-colored. These plants are easily cultivated and grow rapidly in ordinary garden soil into round-headed shrubs sometimes eight or ten feet across. There are forms of them both with yellow fruit, a yellow-fruited form of *I. laevigata* (var. *Herveyi*) having been found a few years ago near New Bedford; it is not yet in cultivation. Two Hollies from the southern states with deciduous leaves and red fruits, *Ilex decidua* and *I. monticola*, are cultivated in the Arboretum; but although their fruit is larger, they are less decorative in this climate than the native species. *Ilex opaca* ought to be more generally cultivated here as the more beautiful English Holly, *I. Aquifolium*, is not hardy in New England. The American species is especially valuable as it is the only broad-leaved evergreen tree which is hardy in this latitude. This Holly grows naturally on the coast near Quincy in this state, and then ranges southward to Texas, in some parts of the country becoming a large and common tree. There is also a form of this tree with yellow fruit. The Ink Berry (*Ilex glabra*) a black-fruited Holly, is one of the handsomest of the broad-leaved evergreen shrubs which are hardy in New England. The branches of this plant are valuable for house decoration, for the leaves do not fall and the fruit retains its color and freshness for a long time after the branches are cut.

Another good plant for house decoration is the common European Privet, *Ligustrum vulgare*, which is a perfectly hardy shrub or small tree formerly much used in this country as a hedge plant and now occasionally naturalized in the eastern states; this is one of the European plants which retains its leaves late in the autumn without change of color, and these make a handsome contrast with the terminal clusters of shining black fruits. Many species of Privet have been introduced in recent years into our gardens from eastern Asia but none of them are as desirable garden plants in this climate as this old-fashioned European shrub which might well be grown for the value of its fruit-bearing branches in house decoration.

Nearly all the Mountain Ashes (*Sorbus*) produce handsome red or orange fruits which keep their color for a long time after the branches are cut. The species with the showiest fruit in the Arboretum is *Sorbus americana*, a common northern tree, several specimens of which can be seen on the right-hand side of the entrance to the Shrub Collection from the Forest Hills gate. These plants are now leafless, but the leaves before they dropped a few days ago had turned to bright shades of yellow and scarlet; but the fruits will remain on the branches in good condition until the flocks of northern robins arrive when they will eat every berry in preparation for their long flight southward. With these plants there is a tall specimen covered with fruit of *Sorbus Matsumurana*, one of the best growing of the numerous eastern Asiatic species in the collection. Several other species, including different forms of the European Mountain Ash (*S. Aucuparia*), are cultivated in different parts of the Arboretum and are usually short-lived.

Many of the Crabapples shed their fruits early in the autumn, but those of some of the forms or hybrids of the Chinese *Malus floribunda* retain them in good condition during the winter or until they are eaten by birds. There is a group of these trees near the eastern end of the Administration Building which do not lose their fruit until spring; these are now bright orange color and, although individually very small, are so numerous that the branches are weighed down by them, the beauty of the fruit being heightened by the color of the leaves which are just beginning to turn pale yellow. Too much cannot be said of the value of *Malus floribunda* as a garden plant in this climate, especially those forms with persistent fruit. No other large shrub or small tree is more beautiful in spring when it is covered with flowers which, rose color in the bud, become white as they develop; the habit is good; it is perfectly hardy, and it never fails to produce a full crop of flowers and fruits. Flower-covered and fruit-covered branches are admirable house decorations.

Fruit-covered branches of the American and Japanese Bittersweets are well suited for house decoration, the orange-colored pods being now open and displaying the seeds in their scarlet pulpy coats. The leaves, which turn yellow before falling, have now disappeared; the fruit, however, will persist for some weeks longer. The American species, *Celastrus scandens*, is usually considered the handsomer of the two species, the fruit being borne in raceme-like terminal clusters and therefore not hidden by the leaves, while in the Japanese species, *C. articulatus*, the smaller fruit is borne in axillary clusters so that until the leaves have fallen it is not very conspicuous. Another species in the collection, *C. flagellaris*, from northeastern Asia where it is widely distributed, has much smaller axillary fruits and, although perfectly hardy, is comparatively of little value as an ornamental vine.

The Snowberries (*Symphoricarpos*) generally retain their fruit late in the autumn, and on many of the plants the leaves are still green and fresh, increasing the beauty of the snowy white berries. There are several species and forms in the Shrub Collection but the handsomest is the common Snowberry of all old gardens, *S. racemosus* var. *laevigatus*, a plant now becoming naturalized in New England. The type of the

species is a much smaller plant with small fruits and therefore of less ornamental value.

The so-called French Mulberry, *Callicarpa americana*, with its axillary clusters of violet-colored fruits, is one of the handsome autumn shrubs of southern woodlands. Unfortunately it is not hardy here, and the only really satisfactory species of this genus which has yet been grown in the Arboretum is the Japanese *Callicarpa japonica*. This is a smaller plant than the American species but the fruit, although smaller, is of the same color and is now conspicuous on the branches from which the leaves have mostly disappeared. There are a number of plants of this small shrub on the left hand side of Azalea Path near its entrance from the Bussey Hill Road.

The silvery white tails of the fruit of a Japanese Clematis (*C. apiifolia*), now make a brilliant show on the right hand side of the Jamaica Plain entrance where this vine has rambed over a number of large shrubs; there is a plant, too, on the trellis at the east side of the Shrub Collection. It is one of the small flowered species, the white flowers appearing after those of the native *C. virginiana* and before those of the Japanese *C. paniculata*. It is hardy, fast-growing and blooms freely every year, and as a decorative plant its value is increased by the late persistence of the fruit, which now forms one of the handsome objects in the Arboretum.

The branches of many other trees and shrubs in the Arboretum are still covered with showy fruits and many of them have great decorative value in addition to their value as garden plants. The branches of the common Barberry, *Berberis vulgaris*, with its drooping clusters of red fruits are very ornamental in the house, as are those of its allies, *B. canadensis*, *B. amurensis*, and *B. Regeliana*. *Berberis canadensis*, which is a native of the southern Appalachian Mountains and southern Missouri, is a smaller plant than the European Barberry with smaller leaves and fruit and is still rare in cultivation. It retains its leaves later in the season than most of the Barberries of this group.

Showy fruits still cover the branches of several Hawthorns (*Crataegus*), especially those of *C. nitida*, one of the most ornamental species of the entire genus, and of *C. aprica*, a southern species which is perfectly hardy here. The best Hawthorn, however, for winter decoration is *Crataegus cordata*, the so-called Washington Thorn, a slender tree of the southern states which is still covered with its leaves now turning orange and scarlet and making a handsome contrast with the small bright red fruits which remain on the branches until spring without change of color.

Among the Cornels or Dogwoods the latest to hold its fruits is *Cornus racemosa*, sometimes called *C. paniculata* and *C. candidissima*, a common and widely distributed native shrub. The leaves have now fallen but the bushes are completely covered with clusters of dull white berries borne on bright red stalks. This Dogwood has been largely used in the Arboretum shrubberies where it is now one of the most conspicuous and interesting objects.

The Arboretum will be grateful for any publicity given these Bulletins.

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Gray Herbarium
Harvard University

No. 36

ARNOLD ARBORETUM

HARVARD UNIVERSITY

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OF

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JAMAICA PLAIN, MASS.

NOVEMBER 14, 1912

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The Arboretum is asked for information about dwarf conifers. In many genera of conifers dwarf individuals, which are seminal or rarely bud-variation forms, have appeared and have been multiplied by nurserymen and others interested in the cultivation of such plants, the largest number of such abnormal forms being found naturally among the seedlings of species which have been the most largely cultivated. The seedlings of no other conifer, perhaps, show so great variation as those of the *Arborvitæ* of the eastern United States, *Thuya occidentalis*. Some of these forms are very dwarf, forming round compact heads only a foot or two high; others grow into large globular masses; others are narrow pyramids, and some have pendulous branches. They vary, too, in the color of the foliage, that of some forms being of different shades of green, and that of others yellow. Like many other dwarf conifers, several of these forms are well suited for the decoration of the rock garden and for dwarf hedges or small beds. The collection of the forms of *Thuya occidentalis* in the Arboretum is probably one of the largest in existence and contains many interesting specimens. It is established on Yew Path leading from the Valley Road to the Hemlock Hill Road, and adjoining the *Arborvitæ*s is the collection of *Chamæcyparis* or White Cedars. The species of this genus from the Pacific Coast are not hardy in New England, so it is not possible to grow here various dwarf forms of *C. Lawsoniana* which are common in European collections. Of the Japanese species, often called *Retinosporas*, there are several dwarf forms, the most beautiful of these perhaps being the variety *nana* of *C. obtusa*. For those who admire plants with colored foliage *C. pisifera argentea* is an attractive small plant. Of the White Cedar of the eastern United States (*C. thyoides*) there are a few interesting dwarf forms. The most conspicuous of these is probably the variety *ericoides*, of dwarf, compact, pyramidal habit, with leaves which as well as the branches, turn reddish brown with the first cold weather and retain this color until spring. Another interesting form is the variety *leptoclada*, also of dwarf habit and bluish green color.

One of the most valuable of all the dwarf evergreens is that variety of the Japanese Yew (*Taxus cuspidata*) which is now cultivated in American gardens as variety *brevifolia*, but is not to be confounded with *Taxus brevifolia*, which is a California tree. This variety of the Japanese Yew has very dark green leaves and wide-spreading, rather irregularly growing branches; it attains a height of only four or five feet but sometimes covers a space ten or fifteen feet in diameter. Seedlings raised from this plant often assume the upright growth of the typical species. In the collection of Yews on Yew Path there is also a small very compact plant of a form of *Taxus cuspidata* which is one of the most distinct and beautiful of all the dwarf evergreens in the Arboretum; this appears to be a unique plant and has not received a name. Nearly all the forms of the European Yew (*Taxus baccata*) suffer more or less severely here from cold and several of them are unable to survive a New England winter. There is, however, one form which is perfectly hardy; this is a broad, flat-topped, rather compact shrub not more than two feet high, with exceedingly dark green foliage. This variety is sometimes sold in American nurseries as *Taxus repandens*; this name has not been published, however, in any of the technical books on conifers and we know nothing here of its

origin. It has lived here entirely uninjured for several years on the edge of the group of Yews on Hemlock Hill Road at the entrance of Yew Path, one of the most exposed positions in the Arboretum. This is certainly a plant of great value for this part of the country.

Among the Junipers there are several dwarf forms of the arborescent species. Of our common Red Cedar, *Juniperus virginiana*, a form with branches spreading close to the ground grows at several places on the coast of Maine. The plants of this form in the collection are too young to show their habit; it has not yet received a name. The form *globosa* of the Red Cedar is a small, round, handsome shrub well worth a place in collections of these dwarfs. The var. *tripartita*, which is not rare in European nurseries, is a low broad shrub with spreading and erect branches forming a wide open head. There are a number of large plants of this form on the left of the entrance to the path which leads from Yew Path to the knoll on which the Juniper collection is established.

Of *Juniperus chinensis* the best known dwarf form is the variety *procumbens*, with elongated branches spreading into wide mats. Of this species there are also in the collection plants of a dwarf form with erect stems forming small, round-topped shrubs. Of the European Savin (*J. Sabina*) the var. *tamariscifolia* is a vigorous prostrate shrub, and the variety *humilis*, which is the smallest of all the Junipers in the collection, is only a few inches high with small, spreading prostrate stems.

Of the conifers of the Pacific coast, with the exception of Lawson's Cypress and the Douglas Spruce (*Pseudotsuga mucronata*), no dwarfs have yet appeared, or, if they have appeared, they have not been multiplied in nurseries; and this seems to be true of the Firs, Spruces, Pines and Hemlocks of Asia with one exception; this is the dwarf form of the Japanese *Pinus densiflora* (var. *pumila*) which is much cultivated in Japanese gardens and is one of the handsomest of all dwarf conifers. This little Pine, which sometimes grows to the height of six or eight feet and forms a head of spreading branches ten or twelve feet through, is perfectly hardy here and is now well established with a number of other dwarf conifers on Conifer Path. Unlike other dwarf conifers, this plant flowers freely and occasionally bears cones. There are dwarf forms of the common White Pine of the eastern states, *Pinus Strobus*, which are decorative plants, and several dwarf forms of the so-called Scotch Pine (*P. silvestris*) which are more pyramidal in habit than forms of the White Pine. The most commonly cultivated dwarf Pine, however, is the Mugho Pine (*P. mughus* or *pumilio*). This is a shrub of the mountains of central and southern Europe and a form of *Pinus montana*, growing sometimes with that tree as on the Pyrenees, and sometimes, as on the Dolomites, by itself without other forms of the species. In cultivation it is a broad shrub with numerous erect stems occasionally reaching the height of fifteen feet and covered with dark green foliage. Plants in cultivation produce cones freely and the seedlings probably retain the habit of the parent. There are two quite distinct forms in the Arboretum collection, one with much coarser leaves than the other. This Pine is perfectly hardy and grows rapidly, but long before it reaches its full size it loses the lower branches and compact form which is the chief beauty of the young plants.

No other conifer, with the exception, perhaps of the eastern American Arborvitae, has shown so great seminal variation as the European or Norway Spruce (*Picea Abies*), and some of these forms are among the most

attractive of all the dwarf conifers. Some of the best of these are variety *Clanbrasiliana*, a low bush seldom more than six feet high, var. *Gregoriana*, usually not more than one to two feet high, and the varieties *pumila* and *pygmaea* both of exceedingly dwarf habit. Of our native Black Spruce (*Picea Mariana*) the var. *Doumettii* is a compact pyramidal plant which does not often grow more than ten or twelve feet tall and is of bluish color. An interesting dwarf form of the Rocky Mountain Blue Spruce. (*P. pungens* or *Parryana*, or as it should be called, *P. Menziesii*) appeared several years ago in the Arboretum nurseries and promises to be valuable as a decorative plant; it has not yet received a name. There is in cultivation, too, a dwarf of the Spruce tree of the Caucasus (*P. orientalis*) which, however, is little known in collections, and in the Arboretum collection are two plants of a dwarf Douglas Spruce.

The genus *Abies*, the Firs, have as yet produced few dwarf forms. The best known is probably the dwarf of the Balsam Fir of northeastern North America (*A. balsamifera*), known in gardens as *A. Hudsonica*, a very dwarf and not particularly attractive plant. There is a dwarf pyramidal form of the Fir of central Europe (*A. Picea*) but this after a few years is apt to lose its dwarf habit and grow into a tall tree. A dwarf form of the Rocky Mountain *A. lasiocarpa* was raised several years ago in the Arboretum and is still a true dwarf in habit, although grafts taken from this plant are beginning to assume the narrow pyramidal habit of the species. The original plant can be seen in the bed of dwarfs on Conifer Path where there are three grafted plants of the dwarf Rocky Mountain Blue Spruce.

The common Hemlock of the eastern states (*Tsuga canadensis*) has a strong tendency to seminal variation, and dwarf and other abnormal forms of this tree often occur in the woods. The most distinct and interesting of these is a compact form with closely appressed pendulous branches forming a broad, low round-topped mass. Many years ago four or five plants of this form were found by the late Joseph Howland of Mattapan, New York, on one of the mountains back of Fishkill Landing on the Hudson River and were named by him Sargent's Hemlock for his friend and neighbor Henry Winthrop Sargent. Only one or perhaps two of these wild plants are now living, although the variety has been much propagated by nurserymen by grafting its branches on the common Hemlock. These grafted plants, as they grow more rapidly and are of more open habit, are less compact and less beautiful than the original seedlings. The plant in the Arboretum among the large collection of dwarf Hemlocks on Hemlock Hill Road is a grafted plant, but at Holm Lea in Brookline there is one of General Howland's original plants. The beautiful Carolina Hemlock (*T. caroliniana*) has not been very largely cultivated, but among the plants in the Arboretum Pinetum near the corner of Centre and Walter Streets are two plants which look as if they were true dwarfs as they are less than one-quarter of the size of the other trees of the same age growing with them and show no tendency to form an upright stem.

The Bulletins will now be discontinued until the spring.

The Arboretum will be grateful for any publicity given these Bulletins.

No. 37

ARNOLD ARBORETUM

HARVARD UNIVERSITY

BULLETIN

OF

POPULAR INFORMATION



JAMAICA PLAIN, MASS.

APRIL 18, 1913

BULLETIN NO. 37.

The remarkable mildness of the winter of 1912-13 will long be remembered by the lovers of plants in eastern Massachusetts. In the Arboretum the Silver Maple (*Acer saccharinum*) was in full bloom on January 23d. The flowers of the Japanese Witch Hazel opened the following day; on January 23d *Hamamelis vernalis* was also in bloom, and on February 2d expanded flowers were found on the European *Daphne Mezereum*.

The Japanese Witch Hazel is too little known here; it is a large, vigorous, and perfectly hardy shrub and there are two forms, one of them blooming a few days before the other. In ordinary seasons they blossom about the middle of February, and for weeks their slender branchlets are bright with the clear yellow of the petals of their numerous flowers. These are uninjured by the severest cold to which they have ever been subjected here, a temperature of several degrees below zero making no impression on them. The Japanese Witch Hazel would be an excellent subject to plant in city yards and with the protection and warmth the plants would obtain from city buildings they would probably flower in Boston in January every year. Although its flowers are smaller than those of the Japanese species, *Hamamelis vernalis* is an interesting plant with considerable decorative possibilities. It is a native of southern Missouri and, although the existence of a Witch Hazel in that part of the country has long been known, it has only recently been distinguished from the autumn flowering species of the northern states. This Missouri species flowered this winter in the Arboretum for the first time in cultivation and is still little known in gardens.

In spite of the warmth of the early winter, which was followed by a few days of hard frost, the general absence of snow and the three cold nights in the first part of this month, few plants have suffered in the Arboretum and less damage has been done to doubtfully hardy species than usual. Many of the new Chinese plants introduced by the Arboretum and planted in exposed positions have now come through two winters—one exceptionally cold and one abnormally warm—without injury and there is, therefore, good reason to hope that several hundred new species of trees and shrubs raised from seed collected by Wilson can be added permanently to New England plantations.

With the exception of some Willows and Alders the earliest exotic tree to bloom in the Arboretum this year is the Japanese *Euptelea polyandra*, a small tree with erect branches and pyramidal habit. The flowers open before the leaves and their beauty is found in the large, conspicuous, orange-red anthers hanging on long slender filaments. The flowers are unisexual but the pistils do not appear until some time after the anthers. *Euptelea* is a small genus confined to Japan and western China. A second species, *Euptelea Franchetii*, raised from Wilson's seeds also promises to succeed in the Arboretum. The plants now in flower of the Japanese species are on the right-hand side of Azalea Path and should be examined by persons interested in rare and curious plants.

Cercidiphyllum japonicum, another Japanese tree, is just coming into flower. Unlike *Euptelea*, the male and female flowers are borne on different individuals and, like those of that genus, the flowers are without sepals and petals. The anthers of the staminate trees are red and rather showy, but the female flowers are inconspicuous. The beauty of the tree is in its foliage. The leaves are rounded and, although smaller, are in shape a good deal like those of the Redbud or *Cercis*. For this reason the name *Cercidiphyllum* has been given to the tree. When the leaves unfold they are bronze red, during the summer they are light green and turn in the autumn to clear yellow. This is the largest deciduous-leaved tree of Japan where it grows in the northern part of the empire scattered through forests of Oaks and other northern trees. *Cercidiphyllum* is a tree of pyramidal habit with a number of stems springing from the ground, and in Japan it often grows to the height of more than one hundred feet. It was introduced into the United States through the Arboretum many years ago and has now become common in collections here. There is a group of these trees on the two sides of the Meadow Road a short distance beyond the Administration Building entering from the Jamaica Plain gate. In western China Wilson found a *Cercidiphyllum* growing on open hill-sides with a tall straight trunk, and therefore quite unlike the Japanese tree in habit. This form, which has been named var. *chinensis*, is growing well in the Arboretum, the young plants showing the single stem habit.

The first flowers of the earliest flowering Cherry in the Arboretum, *Prunus tomentosa*, are already open. This is a native of northern China and in cultivation is a broad, vigorous and perfectly hardy shrub of excellent habit which covers itself every year with large white flowers more or less tinged with red toward the base of the petals. The flowers are followed in early summer by bright red slightly hairy fruits of good flavor. Introduced by the Arboretum from Peking nearly thirty years ago, this has proved one of the most valuable of spring-flowering shrubs. There is a group of small plants of this Cherry on the right-hand side of the road just below the Forest Hills gate, and very large plants can be seen along the Boston Parkway between Perkins Street in Jamaica Plain and Forest Hills.

In the Cherry Group, on the Forest Hills Road, the Japanese and Chinese *Prunus subhirtella* and the Japanese *Prunus pendula* will be in full bloom early next week. The flowers of the former are among the most beautiful of the Asiatic Cherries, and the trees have never been more thickly covered with flower-buds.

The flowers of some of the Forsythias have appeared rather earlier than usual this year, especially those of the var. *Fortunei* of *F. suspensa* which is the form most generally cultivated in the neighborhood of Boston. This genus has given to our northern gardens some of the most beautiful and most satisfactory of all hardy shrubs. The species are all Chinese with the exception of *F. europaea* which was discovered in Albania a few years ago and is of much less value as a garden plant than the Chinese species. *F. viridissima*, the first species cultivated in Europe and America and the latest of all species to flower, is of comparatively little ornamental value. It is, however, one of the parents

of a race of hybrids, *F. Fortunei* being the other parent, known as *F. intermedia*, among which are some exceedingly valuable garden plants. One of these hybrids recently described as *F. intermedia* var. *primulina* originated in the Arboretum a few years ago. It has pale primrose-colored flowers which are produced in crowded clusters. This form is not yet much known in cultivation but it promises to be of exceptional value.

The Buffalo Berry (*Shepherdia argentea*) is in flower in the Oleaster Group on the left-hand side of Bussey Hill Road just above the Lilacs. The Buffalo Berry is a shrub or small tree, with handsome silvery leaves, minute clustered axillary flowers and small crimson or yellow subacid fruits which ripen early in the autumn. It is a common inhabitant of the borders of streams from Saskatchewan to the Rocky Mountains as far south as New Mexico. It is a valuable ornamental plant for the dry interior parts of the continent, and in the west much attention has, in recent years, been paid to it as a fruit plant.

The Spice Bush (*Benzoin aestivale*) is in full bloom on the right-hand side of the Bussey Hill Road opposite the end of the Lilac Group where there are large masses of this shrub. It is a native of the eastern United States and an inhabitant of the borders of swamps where it sometimes grows to the height of ten or fifteen feet. The flowers are small, bright yellow, and the male and female flowers are produced on different individuals, so that only some of the plants bear the small bright scarlet shining fruits which are so attractive late in the season in contrast with the bright yellow autumnal foliage. The leaves are fragrant like those of its relative the Sassafras, and are uninjured by insects. This is one of the common shrubs which should be better known by gardeners. Next to the Spice Bush Group the Leatherwood (*Dirca palustris*) is covered with its bright yellow flowers which appear before the leaves. This beautiful and interesting plant owes its common name to the toughness of the bark of the branches. Rarely cultivated, it deserves a conspicuous position in all collections of hardy shrubs.

On the right-hand side of Azalea Path the Japanese Box (*Buxus japonica*) is already in flower. This is a shrub of rather open habit with small yellow-green leaves, and the only really hardy Box which has been tried in the Arboretum. It is therefore of special interest to persons in search of broad-leaved evergreens suitable for New England gardens. It is remarkable, therefore, that this plant, which was raised here from seed brought from Japan by Professor Sargent twenty years ago, has remained practically unknown in this country beyond the borders of the Arboretum.

The most conspicuous flowers in the Shrub Collection now are those of a little European Heath, *Erica carnea*, which is already covered with its rosy red flowers. This is one of the few perfectly hardy Heaths which can be grown successfully in this climate, and an excellent plant for the early spring rock garden.

The Arboretum will be grateful for any publicity given these Bulletins.

No. 38

ARNOLD ARBORETUM

HARVARD UNIVERSITY

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JAMAICA PLAIN, MASS.

APRIL 25, 1913

BULLETIN NO. 38.

Next week the Arboretum should be visited by lovers of the flowers of early spring for it will then be gay with the white blossoms of the Shad Bushes (*Amelanchier*) which have been largely planted in the shrubberies and mixed plantations, making the last days of April here one of the most delightful weeks of the early spring. *Amelanchier* is largely North American, although there is one small shrubby species on the mountains of central Europe and another species is widely distributed in eastern Asia. In the United States the genus is found with many species in both the eastern and western parts of the country. Two species grow naturally in the Arboretum, *A. laevis* and *A. oblongifolia*. The former, which has been erroneously called *A. canadensis*, is a small tree easily distinguished in spring by the red color of the unfolding leaves which make a handsome contrast with the white flowers. This tree grows on uplands and there are several good-sized specimens at the base of the wooded slope on the south side of the Forest Hills Road in the rear of the lower end of the Apple Group. *A. oblongifolia* grows naturally on the borders of swamps and, although it often grows to a large size, is always shrubby in habit. There is a large wild plant of this species on the border of the north meadow, and it is this species which has been most generally planted in the Arboretum. The other tree *Amelanchier*, the true *A. canadensis*, is a larger plant than *A. laevis*, and it can easily be distinguished by the coat of fine down which covers the lower surface of the leaves which are silvery white, becoming green but never red when they first unfold. This tree is rare in New England, but it is common in western New York where it grows to a very large size, and in the southern states where it is the common species except on the Appalachian Mountains where at high elevations *A. laevis* occurs. There are a number of small shrubby species in the eastern states which are all beautiful and desirable garden plants, but who ever plants them and in what nursery can they be found? Unfortunately, their decorative value as garden plants, like that of so many other native shrubs, has not spread very far beyond the limits of the Arboretum. A complete collection of the species of eastern North America has now been arranged in the border along the grass path which, starting from a point opposite the Administration Building, turns to the right and follows the direction of the Meadow Road.

The Japanese *Prunus Sargentii* is in flower again. As was stated last year in Bulletin No. 20, this hardy tree is considered by many persons the most beautiful of all flowering Cherries. It is a large and perfectly hardy tree; the pink or rose-colored flowers are large and produced in great abundance, the ample dark green leaves turn orange and red in the autumn and the bark is smooth, red-brown and very lustrous. The trees in the Arboretum produce fruit every year in June and seeds will be distributed in the order of application to persons who wish to experiment with this valuable tree. The seeds should be sown as soon as received. There are six specimens of *Prunus Sargentii* on the Forest Hills Road near its junction with the Meadow Road.

Prunus triloba is in flower just below the entrance to the Shrub Collection at the Forest Hills Gate. This is a shrub with bright clear pink flowers about an inch in diameter which appear before the leaves. The double-flowered form of this shrub (var. *multiplex*) is a favorite in China, whence forty or fifty years ago it was introduced into Europe and the United States where it is often cultivated. The much more beautiful single-flowered form grows on the mountains near Peking and appears to have been cultivated for the first time in the Arboretum, to which seeds were sent from China in 1882. Although perfectly hardy, *P. triloba* is not a particularly vigorous plant. It well deserves a place, however, in every garden for the charming color of the flowers.

The Plum trees in the group next to the Cherries and at the principal entrance to the Shrub Collection from the Meadow Road are beginning to open their flower-buds. This year the Chinese *Prunus triflora* is the first to flower. It is a common fruit tree in China and Japan, and from it or from some of its varieties the so-called Japanese Plums, now so popular in the United States, have been derived. The flowers of this Asiatic tree will soon be followed by those of the Canada Plum (*Prunus nigra*) which is the most northern of the American Plum trees, being distributed from Newfoundland to the shores of the Strait of Mackinaw and southward along the northern borders of the United States. It is a small tree with dark, rough bark, and flowers slightly tinged with pink and becoming rose-color in fading. This, perhaps, is not one of the handsomest of the American Plum-trees, but it is valuable on account of its hardiness, the early appearance of the flowers, and the early ripening of the fruit. The Plum Collection is near the principal entrance to the Shrub Collection from the Meadow Road and next to the Cherries.

The Arboretum collection of Willows is planted on both sides of the path which, starting from a point opposite the Administration Building, leads to the Shrub Collection and to the Forest Hills Gate. The collection, which contains a large number of species and hybrids, suffers for want of sufficient space for the proper development of individuals, especially of the species which become large trees, and on the whole is less satisfactory than some of the other groups in the Arboretum. Some of the dwarf shrubby species are now in flower and should be examined by persons in search of beautiful hardy shrubs suited for many decorative purposes. One of the most beautiful of these little Willows is *Salix tristis*, a spreading shrub not more than two feet high with slender stems and small gray-green leaves. The anthers of the male plant are bright red when they first appear and much more showy than the gray inflorescence of the female plant. This little willow grows naturally on dry barren soil from New England to Minnesota and southward. It takes kindly to cultivation and grows equally well on dry ground and in moist peaty soil, and soon spreads into large masses. It is an excellent plant for covering dry barren slopes. *Salix humilis* is another native shrub with gray-green leaves but yellow anthers. This species sometimes grows to the height of from six to nine feet, and the slender red stems make a handsome contrast with the silvery gray flower-clusters. This is also a plant of the northern United States and is as easily cultivated as *S. tristis* in all sorts of soil. In the same group are also flowering two dwarf exotic species, *Salix repens* var.

argentea from northern Europe and Siberia, and *S. gracilistyla*, a shrub three to four feet high from Japan. These plants can be seen on the left hand side of the walk not far from its entrance to the Meadow Road.

One of the first plants in the Arboretum to unfold its leaves in the spring is a shrub of the Rose Family, *Prinsepia sinensis*. The small but numerous, clear yellow, axillary flowers appear soon after the leaves and can now be seen on a well established plant on the upper side of Hickory Path near the Centre Street wall. This north China shrub is still rare in cultivation, but is well worth a place in any collection for its beauty and for its botanical interest.

The Arboretum is often asked about the best shrubs for ground cover, that is to cover the ground under trees or among larger shrubs. The two deciduous-leaved shrubs which have proved the most successful in the Arboretum for this purpose are both natives of the United States. They are the Fragrant Sumach (*Rhus canadensis* or *aromatica*) and the Yellow Root (*Zanthorhiza apiifolia*). The former is rather a straggling plant with slender stems sometimes three or four feet high, although in one of its forms this plant grows much more compactly. The flowers are bright yellow, on short axillary branches appearing before the three-lobed leaves, and followed by red fruits which ripen in June. This has been found a useful plant in the Arboretum, although as a ground cover it has not proved as successful as the Yellow Root. This does not grow so tall, and, spreading rapidly by underground shoots, soon covers the ground with its erect stems. The small purple flowers are produced in terminal erect racemes and open before or with the leaves which are clear bright yellow in the autumn. Unfortunately this plant, which is a native of the Appalachian Mountain region, will not thrive in limestone soil. These two shrubs have been largely planted in the Arboretum and are now in flower.

Some of the forms of *Lonicera coerulea* are in flower in the Shrub Collection. This is a bush Honeysuckle which encircles the northern hemisphere and is attractive in habit with its creamy white flowers and bright blue fruits.

One of the broad-leaved evergreens, *Pieris (Andromeda) japonica*, is in bloom among the Rhododendrons at the base of Hemlock Hill. This is a hardy plant with handsome foliage and clusters of large white flowers which, however, are usually spoiled here by spring frosts. A better plant for this climate is *Pieris (Andromeda) floribunda*, a native of the southern Appalachian Mountains and one of the best broad-leaved shrubs which can be grown here. It forms in cultivation a broad, low, rounded head; the leaves, although small, are dark green, and the creamy white flowers are produced in profusion. The flower-buds are conspicuous through the winter and just now are beginning to open. There is a large specimen of this *Andromeda* in the bed on the north side of Hemlock Hill Road opposite the Laurels.

The Arboretum will be grateful for any publicity given these Bulletins.

No. 39

ARNOLD ARBORETUM

HARVARD UNIVERSITY

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JAMAICA PLAIN, MASS.

MAY 2, 1913

BULLETIN NO. 39.

Many of the Crabapples promise an exceptionally good bloom this year and several of them will be in full flower next week. There is a large collection of these plants in the Arboretum, including several hybrids, for there are few genera in which natural hybrids among cultivated plants are more often found.

The common Apple-tree of the orchard is usually believed to be a hybrid between the two European species, although the so-called Paradise Apple, which is largely used in this country as stock in the propagation of dwarf Apple-trees, is probably a form of *Malus pumila* from eastern Europe, central Asia and the Himalayas. Another important hybrid largely grown commercially and known, at least in this country, as the Siberian Crab is believed to have been obtained by a cross between the common Apple-tree and the small-fruited Siberian Crabapple, *M. baccata*. Plants of this hybrid are fast-growing, very hardy, usually pyramidal small trees. The flowers are handsome but the trees are most ornamental in the autumn when they are covered with their brilliant scarlet or orange, often translucent fruits which are usually from an inch to an inch and a half in diameter. These hybrids are hardy in northern regions too cold for the common Apple-tree, and they are often grown as fruit trees. Their fruit is subacid but valuable when cooked and for preserves. The most curious form, perhaps, of *Malus pumila* in the collection is *M. Niedzwetzkyana* from Turkestan. This small tree, which is one of the first Apples in the collection to bloom, has dark purplish red flowers and fruit, even the flesh of the fruit being purple, purple leaves at least early in the season, and dark bark and twigs. That this tree is only an abnormal variety is shown by the fact that the leaves of seedlings raised in the Arboretum are more often green than red.

One of the handsomest of all Crabapples, *M. floribunda*, is one of the earliest to flower. As it grows in this country it is a broad shrub with a trunk divided at the base into several large stems. The pink flowers, which are deep rose color in the bud, turn white before the petals fall and are produced in the greatest profusion. The dark green foliage is handsome, but the yellow or orange-colored fruits, which are not much larger than peas, make little show. The origin of this plant is uncertain. It was first sent to Europe from Japan, but it is not a native of that country and probably originally came from China, although it is not now known in China in a wild state. By some authors it is considered a hybrid between two of the species of northern China, although it bears but little resemblance to its supposed parents, and seedlings raised from this cultivated plant show comparatively little variation. The largest specimens of this Crabapple will be found in the neighborhood of the Administration Building.

A plant which is evidently a hybrid of *M. floribunda* with one of the hybrids of *M. baccata* appeared spontaneously in the Arboretum several years ago and has been named *M. Arnoldiana*. It has much larger pink flowers and larger fruit than *M. floribunda*, and in flower it is one of the most beautiful of all Crabapples. Another early-flowering form is known as *M. Scheideckeri*, a supposed hybrid of *M. floribunda*, the other parent being probably *M. spectabilis* or *M. prunifolia*. This

plant appeared in Germany a few years ago and is one of the most ornamental of Crabapples. The branches are erect and slightly spreading, forming a narrow pyramidal head. The pink and white flowers are produced in profusion, and the comparatively large yellow fruit is from three-quarters to an inch in diameter. Another pyramidal Crabapple much better known is *M. spectabilis*, a native of northern China and an old inhabitant of gardens. The large pink flowers of this tree as it is known in gardens are more or less double; there are several forms, of which the best, perhaps, is Rivers' Crab (*M. spectabilis Riversiana*), so named for the English nurseryman by whom it was raised or distributed nearly a century ago. The Crabapple of eastern Siberia, *M. baccata*, is a tall, narrow tree with white flowers on long, drooping stems, and yellow fruits not much larger than peas. This is a hardy and handsome tree, but it is less beautiful than several hybrids which were raised in the Arboretum many years ago from seeds sent from St. Petersburg. The parentage of these plants is uncertain, although *M. baccata* is no doubt one of the parents. They are wide-branching, vigorous trees with large pure white flowers and fruits two or three times larger than those of *M. baccata*.

By some persons the Parkman Crab (*M. Halliana*) is considered, when it is in flower, the most beautiful of the group. It is a small and not very vigorous tree, with dark bark, leaves tinged with purple when they first unfold, and bright, clear pink, semidouble flowers drooping on long stalks, and minute fruits. This is probably a Chinese plant which has long been cultivated in Japanese gardens but is not now known in a wild state. It reached America sixty years ago and was first cultivated in this country by the historian Francis Parkman in his garden on the shores of Jamaica Pond. Seedlings of this plant show great variation.

Japanese species which deserve the attention of lovers of hardy plants are *M. zumi* from Japan, with pink and white flowers, and *M. Sargentii*, a native of the borders of salt marshes in the northern island, and the only shrub Apple which is now known. In the Arboretum it has proved a valuable late-flowering plant; and it appears particularly well suited for northern gardens for on the coast of Maine it grows even better than it does here. The last of the eastern Asiatic species to flower is *M. toringo*, from northern China and Japan. This is a small tree with spreading branches, numerous, very small flowers, and minute, red or yellow fruits. A low, shrubby seedling form of this species has appeared in the Arboretum.

The American Crabapples bloom later than the Asiatic and European species. There is one species (*M. fusca*) on the northwest coast and several in the Atlantic states from New York, Michigan and Iowa southward. In the group on the Forest Hills Road and nearly opposite the end of the Meadow Road *M. fusca* is well established. With it there is an interesting hybrid of this and the common Apple-tree named *M. Dawsoniana*. This is a vigorous tree with the peculiar oblong yellow fruit of its American parent. The fruits, however, are much larger and the leaves resemble those of the common Apple. *M. coronaria* from the eastern states and *M. ioensis* from the central west are in this group, and there are plants of *M. angustifolia* from the extreme southeastern states now well established on Hickory Path near Centre Street. Of *M. ioensis* there are two plants opposite the end of the

Meadow Road, of the form known as the Bechtel Crab. This tree has double pale pink flowers which look like small clustered Roses. This is the last Crabapple in the collection to bloom, and one of the most popular plants in the Arboretum, judging by the fact that when the trees are in flower the ground about them is trodden hard by visitors who want to examine them at close range.

There are two groups of Apple-trees in the Arboretum. The first is on the left-hand side of the Forest Hills Road entering from the Forest Hills Gate and opposite the end of the Meadow Road. This collection contains the largest plants in the Arboretum. The second and supplementary collection is arranged at the eastern base of Peter's Hill. The plants are smaller, but this collection contains a larger number of species and hybrids than the other. For the lovers of spring flowers the blooming of the Crabapples is one of the three or four most interesting periods in the Arboretum year.

The earliest of the Viburnums to flower this year is *V. Carlesii*, from Korea, whence it was sent to Europe a few years ago. It is very hardy and blooms freely when not more than a foot high. It is particularly interesting from the fact that the flower-buds are bright orange-red. The inner surface of the corolla, however, is white and as the flowers open the color of the outer surface gradually fades to pink and then to white. As the buds do not always expand at the same time there are therefore in the cluster pink buds among the white flowers. This plant is still comparatively little known, but it seems destined to become a valuable and popular garden plant.

The Mahonia from the northwest coast, *Berberis* or *Mahonia Aquifolium*, with its shining Holly-like leaves, yellow flowers and blue fruits, is well known to garden lovers except perhaps in the extreme northern states where this plant is not very hardy and in severe winters is often badly injured. The much dwarfer and perfectly hardy Mahonia from the southern Rocky Mountains (*B. repens*) is, however, much less known as a garden plant. This plant grows only a few inches high and the leaves lack the lustre of those of the Oregon plant; it spreads rapidly, however, in good soil and soon forms a broad mat. This promises to be one of the best broad-leaved evergreens for ground cover in this climate. It is now in flower in the Shrub Collection.

The earliest true Barberry to flower in the Arboretum is *Berberis dictyophylla* which, although it comes from the southern part of China, is perfectly hardy here. The flowers are solitary or occasionally in pairs in the axils of the leaves, about half an inch in diameter, and pale primrose yellow. The great beauty of the plant, however, is in the leaves which, although not large, are silvery white on the lower surface and in the autumn turn brilliant scarlet on the upper surface while the lower surface retains its spring and summer color. This shrub can be seen with the other Barberries in the Shrub Collection and in the supplementary collection of Barberries on Hickory Path near Centre Street.

Several Honeysuckles (*Lonicera*) and some of the early-flowering Currants and Gooseberries (*Ribes*) are now in flower in the Shrub Collection and deserve the attention of visitors.

The Arboretum will be grateful for any publicity given these Bulletins.

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The earliest Lilac in the collection was in flower at the end of the last week in April and it will be the first of July before the flowers of the latest have faded. The Lilacs are all Old World plants and the genus is confined to eastern Europe, southwestern Asia, the Himalayas, and to eastern Asia, from eastern Siberia to western China and to Japan, the largest number of species having been found in China. Although a great improvement has been made in the flowers of the common Lilac of gardens (*S. vulgaris*) by skillful cultivators of this plant in France and Germany, comparatively few important results have yet been obtained by crossing the different species, although one of the most valuable of all Lilacs as a garden plant is a hybrid between *S. vulgaris* and *S. persica*. This hybrid appeared in the Botanic Garden at Rouen nearly a century ago and through an error as to its origin it was unfortunately called *S. chinensis*. In gardens it is also sometimes known as *S. rothomagensis*. Another interesting hybrid Lilac is known as *S. hyacinthiflora*. This was raised in France and is the result of crossing the common Lilac with the Chinese *S. oblata*. The extremely fragrant flowers are small and double and are borne in small clusters. This plant, however, is chiefly valuable on account of its earliness for, like its Chinese parent, it is one of the first Lilacs to flower. Some of the recently discovered Chinese species will probably be less desirable garden plants than several of the better known species, but it is not impossible that they may prove valuable in the production of new hybrid races. That a great and unexpected prize may be obtained by the breeder of Lilacs is shown in the new race known generally as *Syringa Henryi*. This hybrid was obtained in Paris a few years ago by crossing the Hungarian *S. Josikaea* with the Chinese *S. villosa*. One of the plants obtained from this cross, called Lutèce, is one of the most beautiful of all garden Lilacs, although its Hungarian parent is perhaps the least beautiful of the whole genus, and the last species most breeders would have selected for one of the parents of a new race of garden plants. What therefore may be the result of crossing the small-flowered species collected by Wilson in western China with some of the large-flowered species no one can now predict.

From the wild Lilac (*S. vulgaris*) of the mountains of Bulgaria, with its narrow clusters of small lilac-purple flowers, many varieties have been obtained in the three centuries since this plant reached western Europe. The flowers of these varieties vary from dark purplish red through all the shades of lilac, and to pale pink, white and blue. The flower-clusters vary in length and breadth, and there are single-flowered, semi-double and double-flowered forms. The flowers of some forms are more fragrant than those of others and there is a difference of a week or more in their time of flowering. The double-flowered forms usually bloom later than the single-flowered form, and the double flowers last longer. The wild Bulgarian plant is in the collection and will flower this year. It is on the left-hand side of the path going up the hill through the Lilac Group, and the plant is labelled "*Syringa vulgaris*. Bulgaria." It is interesting to compare the flowers of these wild plants with those of the forms which have been improved by cultivation. There are now one hundred and sixty of these

forms in the collection. Several others are in cultivation, but the Arboretum collection shows the variation which cultivators have produced in the Lilac and contains all the most desirable and valuable kinds. New varieties are produced every year but these show no real improvement over many of the forms produced many years ago, and the appearance of new varieties more valuable than those already in cultivation can hardly be expected.

The Arboretum is often asked for a list of the best garden Lilacs. No two persons, however, will agree on what are the best Lilacs for this is a matter of individual taste. Some persons prefer the white flowers and others the very dark flowers. Some lovers of Lilacs think that none of the new varieties compare in beauty with the purple-flowered Lilac of old gardens. One of the most satisfactory of the lilac-flowered forms is Charles X. Among the single-flowered white varieties no plant produces larger flowers in greater abundance than Marie Legraye; for those persons who admire double-flowered Lilacs none is better than the late-blooming, white-flowered Madame Lemoine. Philémon, Ludwig Späth and Congo are as good as any of the very dark-flowered varieties, and among the pink-flowered varieties *Macrostachya* is a first-rate garden plant. All the forms are equally hardy and equally vigorous; they all grow with nearly equal rapidity. Many of these forms, however, are so nearly alike that it is not easy to distinguish them, and in a collection of ten or twelve can be obtained all that are best worth growing.

In addition to *S. vulgaris* there are now established in the collection twenty species of *Syringa* and some of them are beautiful and desirable garden plants. The first of the species to flower is *S. affinis* from northern China; this is one of the most generally cultivated of all shrubs in the gardens of Peking. The pure white flowers are borne in loose, rather narrow, open clusters, and are extremely fragrant. There is a mauve-flowered variety of this species, var. *Giraldii*, which was discovered a few years ago in western China by a French missionary and which appears to be unknown in Chinese gardens. The two forms are very hardy, grow rapidly, and are blooming well this year. The habit of these plants, however, is loose and not attractive, but they deserve a place in every collection on account of their very early and fragrant flowers. Another Chinese Lilac, *S. oblata*, flowers nearly as early. This plant has the handsomest leaves produced by any Lilac; they are broad, thick and shining, and in the autumn, unlike those of any other Lilac, they turn a deep dark wine color before falling. This plant grows into a large, broad symmetrical shrub. The flowers are pale lilac color and very fragrant, but unfortunately the flower-buds are often injured by late frosts and the brittle branches are frequently broken by ice. When this Lilac is in good condition it is one of the handsomest of the collection, but it cannot be depended on. This year the flower-buds have been killed.

Another north China species, *S. pubescens*, is one of the best of the genus as a garden plant. It is a tall shrub with erect stems, small leaves and large clusters of pale lilac-colored flowers remarkable for the long tube of the corolla and for their delicate fragrance; indeed the flowers of *S. pubescens* are more fragrant than those of any other Lilac, and for this fragrance alone this plant should find a conspicuous place in every northern garden.

Syringa villosa, another north China species, is valuable for it is the last of the true Lilacs to flower. It is a large, vigorous shrub, of excellent habit, with large leaves. The flowers are produced in clusters which vary in size on different individuals; they vary, too, in color from rose to flesh color and occasionally nearly to white. This plant is therefore best propagated by cuttings taken from the best varieties rather than by seeds. The flowers have a disagreeable odor. Only two of the new Chinese species will flower this year, *S. Meyeri* and *S. Julianae*. The former has dark purple flowers, with corolla tubes even longer than those of *S. pubescens*, and is interesting because it begins to flower freely when not more than a foot or two high; its history, too, is interesting. The plants in the Arboretum were raised from seeds gathered in China by F. N. Meyer, a collector of the United States Department of Agriculture. Meyer made no herbarium specimens and has no recollection of the place where he found the plant. No other plants but those in the Arboretum were raised, and the only knowledge of the species has been obtained from the small plants cultivated here. *S. Julianae*, discovered in western China by Wilson, is of the same general character as *S. pubescens*, and is a conspicuous plant in flower as the outside of the corolla is dark purple and the inner surface of the corolla lobes white. The flowers are fragrant but not so fragrant as those of *S. pubescens*. The plant is very hardy but it is too new in cultivation to make it possible to judge of its real value as a garden plant.

Of old-fashioned shrubs now too seldom seen in gardens none are more beautiful than the Persian Lilac (*S. persica*) and its white-flowered variety. The Persian Lilac is a native of southwestern Europe where it is found from the Caucasus to Afghanistan and was cultivated in England as early as the middle of the seventeenth century. In gardens it forms a wide and shapely bush which, after the common Lilac has finished its bloom, covers itself with long clusters of small, fragrant flowers which weigh down the slender branches. This is one of the parents of the hybrid *S. chinensis* already mentioned. This hybrid is a shrub as large or larger than the common Lilac, with slender branches, leaves intermediate in shape between those of its two parents, and large, elongated clusters of purple-red flowers intermediate also in size between those of its parents. There is a variety of this hybrid with nearly white flowers.

There are three tree-like Lilacs with large unsymmetrical clusters of small white flowers which belong to a section of the genus distinguished by the very short tube of the corolla. The first of these to flower, *S. amurensis*, comes from eastern Siberia; this is followed by *S. pekinensis* from northern China, and later by *S. japonica*, the last and most tree-like of the Lilacs.

The Arboretum Lilacs have never given promise of a more abundant crop of flowers, and it is probable that the largest number of plants will be in the best condition during the week beginning on the 14th of May.

The Arboretum will be grateful for any publicity given these Bulletins.

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JAMAICA PLAIN, MASS.

MAY 15, 1913

The Horsechestnut (*Aesculus Hippocastanum*) growing naturally in a restricted area has the power of flourishing and reproducing itself in regions with climates as unlike as those of eastern New England and western Scotland. The home of this tree among the mountains of northern Greece is of such limited extent that, although the Horsechestnut has been cultivated in Europe for more than three centuries, it is only in comparatively recent years that the wild tree has been discovered. The Grecian Horsechestnut is one of the noblest of the exotic trees cultivated in the United States, but for the development of its greatest beauty it requires deep, rich, moist soil and abundant space for the spread of its branches. Few other trees suffer more from smoke, dust, and the other unnatural conditions of city life. There are a number of forms in cultivation but none of them equal the typical tree in beauty. One of the best known of these abnormal forms is the variety with double flowers (var. *Baumannii*, or *flore pleno*). This form flowers later than the single-flowered tree and the flowers last a long time in good condition. There are varieties with erect branches (var. *pyramidalis*) and with erect and spreading branches forming a round-topped tree (var. *umbraculifera*); and there are varieties with variously incised leaflets (var. *incisa* and var. *laciniata*), and with leaves blotched with yellow (var. *variegata*), but these are all horticultural curiosities and of no interest to the general planter.

The so-called red-flowered Horsechestnut, which appeared in Europe many years ago, although its origin is not entirely clear, is probably a hybrid of the common Horsechestnut with the red-flowered *A. Pavia* of the southeastern United States. The right name of this tree is *A. carnea*, although it is often found in nurseries under the name of *A. rubicunda*. It has the general habit and appearance of the common Horsechestnut, but it is a smaller tree and blooms later, and the flowers on different individuals vary from red to pale rose color. The handsomest form (var. *Briotii*) has deep red flowers and is one of the most ornamental of the arborescent Horsechestnuts. The Japanese Horsechestnut (*A. turbinata*) is rather closely related to the Grecian tree and resembles it in general appearance, although the flowers are less showy. In its native country this is a large and handsome tree, and it promises to be a valuable ornamental tree here. The largest specimen in the United States is in Rochester, New York, where the Japanese Horsechestnut has flowered and produced large crops of seeds for several years. The Himalayan Horsechestnut, the species from central China discovered by Wilson, and the California species are not hardy here, and the north China Horsechestnut is not yet established in the Arboretum.

Southeastern North America is the real home of the Horsechestnuts, judging by the multiplication of species in that part of the world where a number of interesting and valuable new forms have recently been discovered. The earliest of the American species to flower is the so-called Ohio Buckeye, *A. glabra*, which has now been in bloom for ten days. This is a small tree with pale yellow flowers, fruit like that of the Grecian tree covered with prickles and dark bark exfoliating in thin flakes. There is a tree of the Ohio Buckeye in the Horsechestnut Group on the Meadow Road, but the largest specimen in the Arboretum is on the left-hand side of the South Street entrance. A form of this tree with usually seven instead of five leaflets (var. *Buckleyi*) is

not otherwise different from the common form and flowers with it in the rear of the Horsechestnut Group. Near this is another form of this tree (var. *leucodermis*) from southern Missouri and Arkansas, with pale bark which blooms about two weeks later than the type and is just coming into flower.

The other yellow-flowered arborescent Horsechestnut of the eastern states (*A. octandra*) differs from the Ohio Buckeye in the absence of prickles from the fruit. It is a larger tree, growing sometimes on the slopes of the southern Appalachian Mountains to the height of eighty feet, and blooms a week or ten days later. This is a valuable ornamental tree which is now rarely found in collections. The other arborescent species of the southern states, the red-flowered *A. Pavia*, is not yet established in the Arboretum, although some garden forms of this tree (var. *atrosanguinea* and var. *Whittleyi*), flower here freely.

From a race of hybrids between *A. octandra* and *A. Pavia* some valuable garden plants have been obtained. This hybrid appeared in Paris at the beginning of the last century and the correct name for it is *A. hybrida*, although in recent European publications it is sometimes called *A. versicolor*. The flowers are of different shades of red, and individuals differ in foliage, in the size and color of the flowers, and in their time of opening. There are two large bushy specimens of this hybrid quite different from each other in appearance in front of the Horsechestnut Group and next to *A. glabra* on the Meadow Road, and other forms can be found in the rear of this group. Of recently described species from the southeastern states only *A. georgiana* from central Georgia will flower this year. This is a broad, round-topped shrub, growing sometimes to the height of five or six feet, with large red and yellow flowers in long compact clusters, and a plant of much promise as a garden ornament. A large bed of this shrub will be found on the path in the rear of the Horsechestnut Group and opposite the mass of *A. parviflora*. This well known shrub is the last of the Horsechestnuts to flower and its tall narrow spikes of white flowers will not open before midsummer. Near this bed are beds of young plants of the yellow-flowered *A. arguta*, a small shrub from eastern Texas, and of the beautiful red-flowered shrub or small tree from the southern and southwestern states usually called *A. austrina*. Much attention has been paid to the formation of the Arboretum collection of Horsechestnuts and it will well repay the attention of persons interested in a beautiful genus of now too little known trees and shrubs well suited for the decoration of northern parks and gardens.

Among the American Magnolias in the group on the right-hand side of the Jamaica Plain entrance *M. Fraseri* is already opening its large cream-colored flowers which are conspicuous on the ends of the branches. This small tree is a native of the southern Appalachian Mountains and is perfectly hardy in the Arboretum. The small, bright canary yellow flowers of *M. cordata* open almost at the same time. This Magnolia was sent from the United States to France more than a hundred years ago and is now only known in the descendants of the trees cultivated in France, all attempts to find the wild trees in recent years having proved unsuccessful. This is a shapely, desirable and perfectly hardy ornamental tree. The leaves are dark rich green; the abundant flowers are of an unusual color for those of a Magnolia, and the second crop of flowers which these trees usually produce in summer adds to its value. The cultivated trees produce no seeds, and as

it can only be propagated by grafting *Magnolia cordata* is rare in collections.

Some of the most beautiful and interesting shrubs now in flower will be found among the Bush Honeysuckles. The decorative value of some of these can best be seen in the grass border by the Bussey Hill Road, opposite the Lilac Group, where several of these shrubs have been so planted that they have abundant space for full development and can show all their beauty of foliage, flowers and fruit. In the Shrub Collection there are a large number of these plants, and others can be found in the supplementary collection in the border on Linden Path in the rear of the group of Linden trees. In the Shrub Collection several interesting species are in flower or will soon be in flower. Attention is called to *Lonicera syringantha* and its variety *Wolfii* from western China, with purple fragrant flowers, and to *L. tibetica*. Two charming plants in this collection are *L. amoena* and *L. amoena Arnoldiana*, the latter a product of the Arboretum. They are garden hybrids, with slender pink flowers, of the Tartarian Honeysuckle, with *L. Korolkowii*, a species of central Asia. Other Honeysuckles now in bloom which should be examined are *L. bella*, a large and vigorous hybrid of *L. Morrowii* with the Tartarian Honeysuckle, *L. minutiflora*, remarkable in the beauty of its brilliantly colored fruits, *L. notha*, a hybrid of the Tartarian Honeysuckle with *L. Ruprechtiana* of eastern Siberia, *L. minutiflora* from central Asia, and the slender and graceful *L. coerulea graciliflora* with its beautiful drooping flowers. Of the shrubs introduced by the Arboretum into New England gardens none is now more generally cultivated or has proved more valuable than *L. Morrowii* from northern Japan. This in cultivation here is a broad high bush with wide-spreading branches clinging close to the ground. The pale blue-green leaves are pleasant in tone, and the yellow flowers are produced in the greatest profusion. This remarkable shrub, which has been largely planted in several of the Boston parks, appears to grow here more vigorously than it does in its native country.

On Azalea path the red-flowered *Rhododendron* (*Azalea*) *Kaempferi* is in flower. There are masses of this plant on both sides of the lower end of this path and between the Hemlocks and the Laurels at the northern base of Hemlock Hill. The shade and coolness of this position suit this inhabitant of the high mountains of Japan, and it flowers later here than on Azalea Path and the flowers remain longer in good condition. These flowers, in front of the dark background of Hemlocks, make one of the most brilliant shows of the Arboretum season.

The earliest of the American *Rhododendrons* to flower, *R. carolinianum*, is opening its flowers in the collection at the base of Hemlock Hill. This is a southern plant with handsome, very dark green leaves and small clusters of bright pink flowers. It grows at a considerable elevation on the Appalachian Mountains and although it was known in England and recognized as a distinct variety as early as 1810, it was afterwards confused with another southern species, *R. punctatum* and entirely lost sight of; and it is only recently that a comparison of the two plants in cultivation has shown the differences between them. It is perfectly hardy and a valuable garden plant. *R. punctatum* is a plant of lower altitudes with smaller leaves and flowers; it blooms several weeks later and is a less valuable plant.

The Arboretum will be grateful for any publicity given these Bulletins.

ARNOLD ARBORETUM

HARVARD UNIVERSITY

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JAMAICA PLAIN, MASS.

MAY 22, 1913

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Hawthorns have been largely planted in the Arboretum and many of these interesting trees and shrubs are now in flower. The principal collections are between the boundary wall of the Arboretum and the Shrub Collection near the Forest Hills Gate, and on the eastern slope of Peter's Hill. The multiplication of the species of Hawthorn (*Crataegus*) in eastern North America is remarkable, and nowhere else beyond the tropics is there a genus of woody plants represented by so many distinct forms. Much attention has been given at the Arboretum in the last fourteen years to the collection, study and cultivation of these plants, and some three thousand lots of seeds of wild plants from different parts of the country have been planted. Among the seedlings raised are, of course, many duplicates, but between six and seven hundred species raised in the Arboretum are now established on Peter's Hill where plants of between fourteen and fifteen hundred of the seedling numbers have been planted in small square beds. Many of these plants are already flowering, and this collection promises to be in a few years one of the important features of the Arboretum both from an educational and an ornamental point of view. It will now repay examination.

The American species of *Crataegus* fall into some twenty natural groups, and on Peter's Hill the species of the different groups are arranged together. In eastern North America Hawthorns are distributed from Nova Scotia and the valley of the St. Lawrence River to central Florida and western Texas. The number of species is greatest, perhaps, in the territory adjacent to Lake Ontario and the streams flowing into it. They are very numerous in the St. Lawrence Valley, in the lower peninsula of Michigan, in southern Missouri and Arkansas, and in the foothill region of the southern Appalachian Mountains. The genus is poorly represented in the Rocky Mountain region and reaches the northwest coast with a single species. Some species are found over thousands of square miles; others are very local. The American Hawthorns vary greatly in size; some species are trees which on the fertile bottom-lands of streams flowing into the lower Mississippi River are sometimes wide-branched and fifty or sixty feet tall, and others are shrubs often not more than two or three feet high. In the Arboretum some species begin to flower at the end of April or early in May and it is the middle of June before the flowers on some species open. No plants hardy in New England produce such abundant crops of beautiful fruits. The fruit of some species ripens in August and from August until November there is a succession of ripening fruits on some of the plants; and on some species the fruit remains in good condition during the entire winter. The species which flower the earliest belong to what is called the Mollis Group from one of its species. These are shapely and often large trees; they all have large flowers, large leaves and large, brilliantly colored and often edible, usually scarlet fruits.

Examples of this group are *Crataegus Arnoldiana*, first found growing wild in the Arboretum, and *C. arkansana* from northern Arkansas; both of these trees can be seen in the group near the Forest Hills Gate, and *C. Arnoldiana* has been largely planted in different parts of the Arboretum. Of *C. arkansana* there is a large specimen on the

left-hand side of the South Street entrance. The fruit of the first ripens in August, that of the latter in October.

One of the most interesting of the natural groups for the decoration of gardens and shrubbery borders is the Intricatae. The plants of this group are nearly all small, late-flowering shrubs, although the group contains a few small trees from the southern Appalachian region. These little shrubs produce very large flowers usually in few-flowered clusters; their fruit is often showy and their leaves turn brilliantly in the autumn. The largest number of the species of the Intricatae have been found in Pennsylvania and Michigan; they occur also in western New England, in New York and Ontario, but are extremely rare in all the region west of the Mississippi River. The plants of this group are arranged together on the lower side of the road at the eastern base of Peter's Hill and will soon be in bloom.

In the old collection, near the Forest Hills Gate, several other groups are well represented by flowering and fruiting plants; the Crus-galli by *C. fecunda*, a large wide-spreading tree from the neighborhood of St. Louis; the Dilatatae by *C. coccinioides* from the same region, well distinguished by its very compact clusters of large flowers; the Virides by *C. nitida* from the bottom-lands of the Missouri River in Illinois, opposite St. Louis, a handsome, flat-topped tree with wide-spreading branches; the Pruinosa by the type of the group, *C. pruinosa*, a widely distributed eastern tree and one of the most beautiful of the genus both in its flowers and fruits; the Flavae, a group confined to the southeastern states, by *C. aprica* from the neighborhood of Ashville, North Carolina; and the Tomentosae by several forms of *C. tomentosa*, by the beautiful *C. succulenta* with its drooping clusters of brilliant fruits, and by *C. prunifolia*, a plant which, although it has been cultivated in England for more than a century, has not yet been found growing wild.

On the south slope of the Overlook on Bussey Hill there is a group of several plants of *C. punctata*. This is a large, wide-branched, flat-topped tree and one of the commonest and most widely distributed of American Thorns, growing from the St. Lawrence Valley to North Carolina and to Illinois. This species is interesting because some individuals bear red and others bright yellow fruit.

Species of *Crataegus* are few in western Europe and in all of Asia, but there are a number of handsome species in southeastern Europe, Asia Minor and the Caucasus. Nearly all the Old World species and many of their varieties are now growing more or less well in the Arboretum and can be seen both in the old collection and on Peter's Hill. Among the exotic species none is more beautiful here than *Crataegus pinnatifida* from northern China and Manchuria. This is a plant with large and very deeply divided lustrous leaves. Growing wild it is a medium-sized shrub with comparatively small fruits, but it has been long cultivated in orchards in northern China as a fruit tree, and by cultivation it has been developed into a tree with large and edible fruits.

Many of the North American Hawthorns grow naturally in limestone soil, but in cultivation they thrive in all soils, grow rapidly, and many of the species begin to flower when very small. They suffer, like many other plants of the Rose Family, from the attacks of the San Jose scale, and the leaves are often disfigured or killed by the larvae of a

leaf-mining insect which causes them to turn brown in early summer. These, however, are pests which can be controlled, and the American Hawthorns, the existence of many of which was not even suspected a dozen years ago, seem destined to play an important part in the decoration of American and European parks and gardens.

Another North American genus of the Rose Family, *Aronia*, sometimes considered a section of the genus *Pyrus*, also contains plants valuable for the garden and the shrubbery. There are three species, all widely distributed in the eastern part of the country, *A. melanocarpa*, *A. atropurpurea* and *A. arbutifolia*; they all have small white flowers in erect compound clusters, showy fruits and handsome foliage. The typical *A. melanocarpa* is a shrub 12 or 18 inches high with stems spreading into a broad mat. There is a form of this species (var. *elata*), however, which is much more common and grows into a tall, broad shrub from 6 to 10 ft. tall, and another form (var. *grandifolia*) with broader leaves, also a tall shrub. The fruit of these species is black and lustrous, and drooping on long stems remains on the plant until the beginning of winter. *Aronia atropurpurea* is also a tall erect shrub, in general habit and foliage like the var. *elata* of the first species. The fruit, however, is dark vinous red and ripens and falls earlier. The leaves of these two species turn orange and red in the autumn before falling. *Aronia arbutifolia* is a tall, slender and more irregular growing plant with later flowers, smaller leaves and erect clusters of smaller bright scarlet fruits which remain on the plants without change of color well into the winter. The brilliant fruit and the bright scarlet of the autumn leaves make this late in the season one of the most beautiful of the native shrubs. All the forms of *Aronia* take kindly to cultivation and are now in flower in the Shrub Collection. They have also been largely planted in the shrubberies along the Arboretum roads.

The Highbush Blueberry, *Vaccinium corymbosum*, has never flowered more abundantly in the Arboretum than this year, and it is desirable to call attention again to this wonderful plant which is beautiful in its flowers, its abundant edible blue fruits, and in the splendid scarlet of its autumn leaves. The Highbush Blueberry, which grows naturally along the moist borders of swamps and other low places where it occasionally reaches the height of twelve or fifteen feet, is easily cultivated and grows freely in good garden soil. On the plants in the Arboretum, where they have been largely planted, the flowers differ considerably in size and in the time of opening. They vary, too, in the size and quality of the fruit, but all the forms are equally valuable as garden ornaments. For its fruit, which is the best of all Blueberry fruits, for the beauty of its flowers and its autumn leaves, this shrub cannot be too often planted. There are several plants on each side of Azalea Path near its entrance from the Bussey Hill Road, and the Highbush Blueberry can be seen now in full flower in many of the roadside plantations.

The Arboretum will be grateful for any publicity given these Bulletins.

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For the decoration of northern gardens there are no more beautiful or desirable shrubs than the Azaleas of eastern North America. There are seven species of these plants and they are now all called Rhododendrons by botanists, and in the Arboretum all Azaleas are labeled Rhododendrons. The first species to bloom, *R. Vaseyi*, begins to flower the beginning of May and the flowers of the last, *R. viscosum*, can be found here as late as the middle of July, so that the Azalea season is a long one. *R. Vaseyi* is a tall shrub, with slender stems and an open irregular habit. In its home in the sheltered valleys of the Blue Ridge in South Carolina it sometimes grows to the height of from fifteen to eighteen feet. The flowers are produced before the leaves appear in small compact clusters and are pure pink in color, but occasionally plants are found with nearly white flowers. Although this plant was not discovered until comparatively a few years ago, it has been much planted in gardens near Boston and it is fast becoming here one of the most popular of the early-flowering spring shrubs. With *R. Vaseyi* the Rhodora (*R. canadense*) flowers. This well known dwarf shrub often covers, especially in the north, large areas of moist or swampy land with a sheet of bloom. The small flowers, however, are of a rather unattractive rose-purple color, and the fame of the Rhodora is perhaps due more to Emerson's poem than to its intrinsic beauty. Naturally the Rhodora grows from Newfoundland to Pennsylvania and New Jersey.

The next to bloom are the two pink-flowered species, *R. canescens* and *R. nudiflorum*; the former is a northern and the latter a more southern plant and is especially common in the Gulf States from Florida to eastern Texas. The flowers of these plants open before or with the unfolding of the leaves and in early spring fill the woods with beauty and fragrance. Both species can now be seen in flower on Azalea Path, and there is a large mass of *Azalea canescens* on the right-hand side of the Meadow Road in front of the Linden Group.

The Flame-colored Azalea, *R. calendulaceum*, is the next species to flower and is already beginning to open its orange, yellow, or reddish flowers which are not fragrant. This shrub is an inhabitant of the Appalachian Mountain region from southern New York to Georgia, and is extremely abundant on the lower slopes of the high mountains of North Carolina and Tennessee. In flower it is the most showy of our Azaleas and one of the most beautiful of all flowering shrubs. A large mass of this Azalea has been planted on the slope below Azalea Path and occasional large specimens can be seen in the border plantations along some of the roads.

The next species to flower, *R. arborescens*, is also a native of the Appalachian Mountains on which it grows from Pennsylvania to Georgia and where in sheltered valleys it sometimes attains the height of fifteen feet or more. The flowers, which appear after the leaves are nearly fully grown, are white or faintly tinged with rose color and are made conspicuous by the long bright red filaments of the stamens. The flowers are very fragrant and the young leaves have the odor of new mown grass. Less showy in flower than the Flame-colored Azalea it is one of the most beautiful of all hardy Azaleas.

The last species to flower, the Clammy Azalea or Swamp Honey-suckle, is a common inhabitant of the swamps of the eastern states, especially of those in the neighborhood of the coast. The rather small flowers are pure white and covered with clammy hairs, and the leaves are often of a pale bluish color, especially on their lower surface. This plant is valuable for the lateness of its flowers which do not open until the flowers of most hardy shrubs have passed, and for their fragrance.

These shrubs are all perfectly hardy in eastern Massachusetts and flourish in all exposures and in good garden soil, although like all *Rhododendrons* they cannot be made to live in soil strongly impregnated with lime. They are not often cultivated because it is not easy to find these plants in nurseries, for few nurserymen, especially in the United States, care to take the trouble to raise such plants from seeds, the only satisfactory way in which they can be propagated. In beauty, constitution and hardiness they are superior to the so-called Ghent Azaleas which are hybrids between the species from the Caucasus, which is not hardy here, and some of the American species. The Ghent Azaleas are favorites with European nurserymen who propagate them by grafting and they are imported in large numbers into this country. Here they grow slowly; many of the varieties are not at all hardy and others are liable to lose large branches in severe winters. The American species are better garden plants here, too, than the yellow-flowered Asiatic species, *R. japonicum*, usually called *Azalea mollis* in gardens, a common Japanese and Korean plant, and the Chinese *R. sinense* or the hybrids of these two species. *Azalea mollis* is hardy and free-flowering but the plants are short-lived in this country. The little known *R. sinense* with its beautiful yellow flowers is hardy but the flower-buds have usually been killed in each of the two or three winters this plant has been exposed here in the open ground.

The Japanese and Chinese *Viburnum tomentosum* is now in flower. This is a large shrub with wide-spreading horizontal branches along the upper side of which the flat flower-clusters are thickly placed and are surrounded by a ring of pure white sterile or ray flowers which make the conspicuous part of the inflorescence. The flowers are followed in the late autumn by brilliant fruits which, scarlet at first, become black when fully ripe. The leaves turn orange and scarlet in the autumn. There is an interesting narrow-leaved form of this plant (var. *lanceolatum*), discovered in Japan by Professor Sargent, now flowering in the Arboretum. There are also two "Snowball" forms of this plant developed in Japanese gardens and much cultivated here and in Europe under the name of *Viburnum plicatum*. The correct name of the more common of these two plants is *V. tomentosum*, var. *dilatatum*. This is the Japanese Snowball usually cultivated in this country and it will not be in its best condition for another week or ten days. The other form (*V. tomentosum*, var. *dilatatum*, f. *rotundifolium*), which appears to be a dwarfer plant, has been in flower for the last ten days. These forms of *Viburnum* can be seen growing together in the large collection of *Viburnums* recently arranged on Bussey Hill Road just before it turns into the Valley Road near the Centre Street Gate.

Viburnum tomentosum and the Corean *V. Carlesii* are ornamental plants of great beauty and value but, with the exception of these two plants, none of the eastern Asiatic species compare in value as decora-

tive plants with the *Viburnums* of North America. To these much of the late spring and early summer beauty of the Arboretum shrubberies is due, and the successful cultivation here of these plants is at last making their value known and appreciated. Thirty years ago it was practically impossible to buy an American *Viburnum* in any nursery, but now several of the species are largely propagated in many North American nurseries and have been used in considerable quantities in many American parks.

About a dozen of the American *Viburnums* are thoroughly established in the Arboretum, the different species flowering through period a of two months. The earliest to flower and the most difficult to establish here satisfactorily, *V. alnifolium*, often called *V. lantanoides*, the Hobble Bush or Moosewood of northern woods, has been out of flower for several weeks and now the only species in flower is the Black Haw, *V. prunifolium*. This is a small shapely tree of the Middle States where it is often extremely common. The flowers are in convex clusters and are followed by sweet blue-black fruits. These and the leaves, which late in the season turn deep wine color, make this a particularly attractive plant in the autumn. Several other species will be in flower in a few days and will be mentioned in later issues of these bulletins.

Three species of *Enkianthus*, an Asiatic genus of the Heath Family, are unusually full of flowers and flower-buds this year. The largest of the Japanese species, *E. campanulatus*, is now in flower and the flowers of the other species will open in a few days. *E. campanulatus* is a tall shrub with bell-shaped flowers hanging gracefully in long clusters which are partly hidden by the leaves. There are two forms in the collection, one with pale yellow flowers striped with red, and the other with rather smaller red flowers. The leaves of all these plants turn brilliant scarlet in the autumn and for its autumn colors *E. campanulatus* is much cultivated in Japanese gardens. The three species are in the Shrub Collection, and there is a large group of them on the lower side of Azalea Path where *E. campanulatus* can now be seen in its greatest spring beauty.

Of Chinese plants flowering here for the first time attention is called to *Lonicera Koehneana*, a large hardy and vigorous shrub with dark red-purple branchlets, thick yellow-green leaves with conspicuous veins and pale yellow flowers slightly tinged with red on the outer surface of the corolla, and to *Neillia sinensis*, an interesting plant related to the *Spiraeas*. The former is in the bed of Chinese shrubs on the southern slope of Bussey Hill, in which a number of the new *Cotoneasters* are also in flower, and the *Neillia* is on Hickory Path near Centre Street.

The Arboretum will be grateful for any publicity given these Bulletins.

ARNOLD ARBORETUM

HARVARD UNIVERSITY

BULLETIN

OF

POPULAR INFORMATION



JAMAICA PLAIN, MASS.

JUNE 5, 1913

BULLETIN NO. 44.

At no other time in the year is the Arboretum more interesting and attractive than in the early days of June. The leaves of many trees have now grown to their full size; those of others are still in their vernal stages. The conifers are now covered with the tender green of their new shoots and are more beautiful than at any other time of the year. The Rhododendrons are fast opening their flowers and these will soon be followed by those of the Laurel (*Kalmia*); many Azaleas are blooming, and the flowers of Viburnums, Cornels, and other native shrubs add to the beauty of the plantations.

One of these native shrubs or small trees, *Viburnum Lentago*, sometimes known as the Nannyberry, is now very conspicuous in many parts of the Arboretum. Few more beautiful shrubs than this common inhabitant of the roadside and the wood-border of New England can be found in any part of the world. It is a shrub or small tree sometimes twenty feet high with a broad round head. The leaves are large, thick and lustrous, and in the autumn assume delicate shades of red and orange; the flowers are creamy white and are borne in large and abundant convex clusters, and the large blue-black fruits hang on drooping stems and do not disappear from the branches until the beginning of winter. In the first week of June the Arboretum owes much to this plant. Another arborescent Viburnum, *V. rufidulum*, from the southern states is a plant of much beauty; it is the largest of the American species and sometimes grows in Louisiana and Arkansas into a shapely tree thirty or forty feet high with a tall stem and spreading branches. The flower-clusters are usually smaller than those of *V. Lentago*, but the leaves are larger and much more lustrous, and no other Viburnum has such handsome foliage. It is distinguished by the rusty red felt which covers the winter-buds and the edges of the leaf-stalks, and is found on the lower surface of the leaves. The plants of this Viburnum in the Arboretum are still small; the best one is on Hickory Path near Centre Street and is now in flower.

One of the handsomest American Viburnums, *V. pubescens*, is also in flower. This is a tall shrub with small pointed leaves and small nearly flat clusters of white flowers, which are produced in such abundance that they almost entirely cover the plant. This Viburnum grows naturally on limestone soil although limestone is not essential to it and is therefore valuable in a large part of the country where limestone prevents the cultivation of many plants like Rhododendrons, Azaleas, and other members of the Heath Family. There is a large mass of *V. pubescens* on the right-hand side of Bussey Hill Road opposite the upper end of the Lilac Group. Just above these there is a group of *Viburnum acerifolium*, another northern shrub sometimes called Arrow-wood, a common inhabitant of the eastern part of the continent. It is a small shrub with leaves which resemble those of some Maples, small clusters of white flowers raised on long stems, and black fruits. This plant is valuable as an undershrub for it grows well in comparatively dense shade.

A plant of *Viburnum bracteatum*, on Hickory Path near Centre Street, will soon be in flower. This is the rarest of American Viburnums, being known to grow naturally only on the cliffs of the Coosa River near Rome, Georgia, where it is a tall shrub with numerous slender stems. With it on Hemlock Path is a plant of the form of *Viburnum pubescens* from southern Missouri and Arkansas which has sometimes been called *V. affine*. Another exceedingly rare species, *V. molle*, from southern Kentucky and southern Missouri, with large, nearly round thick leaves on long stems, will also soon be in flower. It is in the general Viburnum Group on the Bussey Hill Road near its junction with the Valley Road and near the Centre Street entrance.

Viburnum americanum is one of the species with palmately lobed leaves, flat flower-clusters surrounded by a ring of showy white ray flowers, and red fruits; it is a tall broad shrub common in northern woods and particularly ornamental late in the autumn when the leaves turn yellow and orange color and the brilliant translucent fruits, which sometimes remain on the plants through the winter, are very conspicuous. There are two other species of this particular group now in flower, *V. Opulus* and *V. Sargentii*. The former is a native of northern Europe and Siberia; the flower-clusters are smaller than those of the American species but it is a larger and handsomer shrub with thicker and darker green leaves which fall later in the autumn, and rather larger, darker colored fruit. There is a variety of this plant with yellow fruit (var. *xanthocarpum*); another variety is a low, dense little bush (var. *nanum*) which very seldom flowers. The old-fashioned Snowball or Guelder Rose is a variety of *V. Opulus* with all the flowers sterile. *V. Sargentii* is a common shrub in northeastern Asia and when it is in flower it is the handsomest of these three species, for the ray flowers are larger than those of the American or the European plant. The dark green leaves with the long, narrow terminal lobes are interesting, but the fruit of this plant is comparatively small, dull-colored, and much less attractive than that of the other species.

A little later *Viburnum cassinoides* will be in flower. To many persons this tall shrub of northern swamps and swamp borders is considered the handsomest of the American Viburnums. In cultivation it is a rather low, broad plant. The leaves, which vary greatly in shape and size on different individuals, are thick and dark green; the flowers are creamy white and are arranged in large or small convex clusters and are followed by drooping fruits which, when fully grown, at first green, gradually turn flesh color or pink and finally dark blue, and are covered with a glaucous bloom, the fruit of the different colors sometimes appearing together in the same cluster. This plant takes kindly to cultivation and has been largely planted in the roadside shrubberies. Among the individuals in the large group of this species in the general Viburnum Group on Bussey Hill Road can be seen its leaf variations. The southern relative of *V. cassinoides*, *V. nudum*, has never become established in the Arboretum, although as it grows at high altitudes on the Appalachian Mountains it should prove hardy in New England.

Three blue-fruited American Viburnums, *V. dentatum*, *V. venosum* and *V. Canbyi*, will not be in bloom for some time, the latest of them, *V. Canbyi*, carrying the flowering of these plants to midsummer, so that the flowers of American Viburnums can be seen in the Arboretum from the middle of May to the middle of July.

One of the latest of the Bush Honeysuckles, *Lonicera Maackii*, is in flower in the Shrub Collection. This is a tall, narrow plant with dark green leaves. The flowers are white and larger than those of any of the Bush Honeysuckles, and are very handsome. The small bright red fruit remains on the branches until the beginning of winter and long after the leaves have fallen. This shrub, which comes from the region of the Amoor river, in eastern Siberia, is perfectly hardy and an exceedingly valuable decorative plant which well deserves a place in all collections of hardy shrubs. The variety of this species, (var. *podocarpa*) from western China flowers a few days later than the northern plant; the flowers are smaller and less beautiful, but the fruits are larger, and, ripening before the leaves lose their summer green, make the plant attractive in the late autumn.

Some species of Mock Orange (*Philadelphus*) are already flowering. The earliest to bloom in the collection is *P. Schrenkii* var. *Jackii*, a plant discovered by Mr. Jack in Korea a few years ago. It is a hardy shrub with erect stems and rather small flowers. *P. hirsutus* from the southern Appalachian region and *P. tenuiflorus* from eastern Siberia are also in bloom. There is a large collection of species, varieties and hybrids of *Philadelphus* in the Arboretum. They are planted in the Shrub Collection and in a supplementary collection forming a large group on the Bussey Hill Road opposite the Lilac Group. Many useful hardy shrubs with beautiful flowers are found among these plants which will be in bloom now for several weeks and will repay careful study by persons interested in such plants.

In great beauty now are *Aesculus carnea Briotii* and *A. georgiana* in the Horsechestnut Group; *Lonicera Korolkovii* and its hybrids and varieties in the Shrub Collection; the lovely blue and white flowered *Sophora viciifolia* on Hickory Path near Centre Street; the two new Chinese Cotoneasters in the Chinese Shrub Collection on the south side of Bussey Hill, *C. hupehensis*, *C. divaricata* and *Syringa villosa*, *S. Julianae*, and the hybrid *S. Lutèce* in the Lilac Group.

An illustrated guide to the Arboretum containing a map showing the position of the different groups of plants has recently been published. It will be found useful to persons unfamiliar with the position of the different groups of plants. Copies of this guide can be obtained at the Administration Building in the Arboretum, from the Secretary of the Massachusetts Horticultural Society, 300 Massachusetts Avenue, Boston, from The Houghton, Mifflin Company, 4 Park Street, Boston, at the Old Corner Bookstore, Bromfield Street, Boston, and at the office of the Harvard Alumni Bulletin, 50 State Street, Boston. Price, 30 cents.

The Arboretum will be grateful for any publicity given these Bulletins.

ARNOLD ARBORETUM

HARVARD UNIVERSITY

BULLETIN

OF

POPULAR INFORMATION



JAMAICA PLAIN, MASS.

JUNE 12, 1913

The evergreen Rhododendrons in the Arboretum have never bloomed more fully than they have this year and the clusters of flowers and the individual flowers have never been larger. The flowers of some of the early flowering species and varieties have already passed, but those of many of the most important plants are still in good condition and others are still to open.

The hardiest in this climate of all the large-flowered Rhododendrons is *R. catawbiense*, an inhabitant of the upper slopes of the highest of the Appalachian peaks on which it grows in great quantities at altitudes between five and six thousand feet. It is a wide, low, round-topped, compact shrub with broad, dark green leaves and rose-purple flowers of a rather disagreeable color. There are a number of plants of this Rhododendron brought from North Carolina now in flower in the collection. This species is one parent of the race of hybrid Rhododendrons which are usually cultivated in northern gardens and practically the only evergreen Rhododendrons found in those of the north-eastern United States, with the exception of another species of the eastern states, *R. maximum*. This race of hybrids has been made by crossing *R. catawbiense* with some of the species from the Himalayas, chiefly probably with *R. arboreum*, with *R. maximum*, and in the early days of Rhododendron cultivation in England with the Caucasian *R. ponticum*. These catawbiense hybrids, as they are called, are hardy and valuable in this country in proportion to the influence on them of *R. catawbiense*.

Rhododendron maximum, which grows naturally as far north as New England, is of course perfectly hardy; it has long and very handsome leaves, and the pale pink or pink and white flowers are beautiful in color, but they open so late that the flower-clusters are much hidden by the young branches which have grown from buds below the flower-bud before the flowers open, while in *R. catawbiense* and its hybrids these branches do not begin to grow until after the flowers have faded. Several hybrids between *R. maximum* and *R. catawbiense* are in cultivation. One of these, known as *R. delicatissimum*, is one of the hardiest and most beautiful of all Rhododendrons which can be successfully cultivated in this climate. As a rule hybrids of hardy plants are as hardy as their parents, but this is not always true of *R. catawbiense-maximum* hybrids, for some of these, like *R. wellerianum* and several raised in the neighborhood of Boston, are not very hardy, a fact due no doubt to some tender strain in the Catawbiense parent, itself a hybrid.

Two other species of the southern Appalachian region are also hardy here, *R. carolinianum* and *R. minus*, or, as it has been more generally called, *R. punctatum*. These are small shrubs with small dotted leaves and small clusters of pink flowers. The differences between these two plants have only recently been understood. *R. carolinianum* is an inhabitant of high altitudes, with handsome dark green leaves, and flowers which open and fade before the young branches begin to grow, and therefore are not hidden by them. This is perhaps the handsomest of all the dwarf Rhododendrons which can be successfully grown here; it has been out of bloom for several weeks. *R. minus* is a plant of lower altitudes, with smaller leaves and flowers and more open habit, and the small flower-clusters are much hidden, like those of *R. maximum*, by the young branches which rise high above them.

A few other species are hardy in this climate. The most distinct and the handsomest of these is *R. Smirnovii* from the Caucasus. This is a large plant with dark green leaves covered below with a thick mat of nearly white felt, and large clusters of large bright pink flowers. This plant is perfectly hardy but it grows best in partial shade as our hot sun causes the leaves to curl in summer. If the right position can be found for it, however, this is one of the most beautiful of the evergreen Rhododendrons which can be grown successfully in eastern Massachusetts. Hybrids of this plant with some of the Catawbiense hybrids are hardy and interesting plants. *R. micranthum* is another species which proves to be hardy here. It is a plant widely distributed from northern to western China and in its native country sometimes grows from six to eight feet high. The small leaves and small compact clusters of small white flowers look like those of a *Ledum*. There are a number of plants of this Rhododendron in flower at the base of Hemlock Hill and there are others on Azalea Path. The two dwarf Rhododendrons from the mountains of central Europe, *R. ferrugineum* and *R. hirsutum*, are in the collection and the latter is now in flower. These plants, however, are not very satisfactory in this climate, and unless exceptionally good positions can be found for them they are not long-lived here. Two hybrids, however, in which these European Rhododendrons have played their part are valuable garden plants in this climate. The first of these, *R. myrtifolium*, is a hybrid between *R. hirsutum* and *R. minus*, and is a very compact, round-topped shrub, sometimes growing to the height of four feet, with small flowers of a good shade of pink. The great value of this plant is in its compact habit and handsome foliage. The second of these hybrids, *R. arbutifolium*, is the result of a cross between *R. ferrugineum* and *R. minus*. This is a plant with a more open habit than *R. myrtifolium* and soon spreads into a wide low mass of handsome foliage; the flowers are small and of an unattractive rose color, and the value of the plant is found in its ability to cover either sunny or shady banks and for this it is admirably adapted. This plant is usually found in nurseries under the name of *R. Wilsonii*, a name, however, which properly belongs to another hybrid between two Himalayan species.

Persons who study the Arboretum Rhododendrons with a view of establishing collections of these plants must remember that the position of the Arboretum collection on the northern and northeastern sides of a thick wood of conifers is an exceptionally favorable one for these plants, and that many of the Catawbiense hybrids now flowering in the Arboretum cannot be depended on in less favorable positions. The number of these hybrids which are really hardy in all situations in Massachusetts is not large. Some of them which have grown in eastern Massachusetts for many years and have proved perfectly hardy here, even in exposed positions, are among the red-flowered varieties, *Atrosanguineum* (very early), *Charles Dickens* and *H. W. Sargent* (late); among the pink-flowered varieties, *Mrs. C. S. Sargent* and *Henrietta Sargent*, similar in general appearance but the latter with smaller and more compact flower-clusters and flowers of a less perfect pink; among the rose-colored varieties, *Roseum elegans* and *Lady Armstrong*; among the dark purple-flowered varieties, *Purpureum grandiflorum*, *Purpureum elegans*, and *King of the Purples*; among the light purples, *Everestianum*, one of the hardiest of these hybrids; among the whites, *Catawbiense album* (early), *Album elegans* and *Album grandiflorum* (both

slightly tinged with blush); and among the whites tinged with pink *Delicatissimum* (very late).

The Chinese *Chionanthus retusa*, although by no means a new plant, is flowering now for the first time in the Arboretum. It is related to the eastern American Fringe-tree or Old Man's Beard (*C. virginica*), when in flower one of the most beautiful of the small trees or shrubs of eastern North America where it grows from New Jersey and Missouri to Florida and Texas. This plant with its long drooping clusters of flowers with their long narrow white petals is a familiar object in most old gardens in this country, where it is always an object of interest. As an ornamental plant the Chinese species is much less attractive than its American relative; the leaves, although darker green, are smaller, and the flowers, which are produced in short, nearly erect clusters, are much smaller with shorter petals. Except as another instance of the close relationship between the floras of eastern North America and eastern Asia the Chinese *Chionanthus* is of comparatively little interest. The two species are growing on the Bussey Hill Road just above the Lilac Group and there are plants of them both on Azalea Path.

Two Andromeda-like plants are now in good condition, *Leucothoe Catesbaei* and *Lyonia mariana*. The former is an evergreen with long spreading and arching stems clothed with handsome long-pointed leaves, and small clusters of axillary white flowers; it is a native of the southern Appalachian region and one of the hardiest and most desirable of the broad-leaved evergreen shrubs which can be grown in this climate. For the development of its greatest beauty, however, it needs rather moist soil and a shady position. It has been planted in large numbers along the brook and in the small ravine at the base of Hemlock Hill and is now flowering freely. *Lyonia mariana* is a smaller shrub with deciduous leaves and larger, white, racemose flowers borne on leafless shoots. This plant is common in the eastern states from Rhode Island southward, and in cultivation is not particular about soil or situation. There is a large mass of it now in full flower on the right-hand side of the Meadow Road in front of the Horsechestnut Group; and these two species are in the Shrub Collection.

In the Philadelphus Groups many plants are beginning to flower every week. *P. coronaria*, the Mock Orange of old-fashioned gardens, with its small, creamy white fragrant flowers, is already in bloom and near it in the Shrub Collection *P. Falconeri* is covered with its delicate white blossoms. The origin and the native country of this graceful shrub are still unknown. Of all the gifts which science has made to gardens few are more beautiful and valuable than the race of hybrid Philadelphus known generally as *P. Lemoinei*. There are a large number of these hybrids in the collection and they will bloom in succession during several weeks. The earliest this year are called Boule d'Argent and Manteau d'Hermine. The value of these wonderful little plants is now recognized in many nurseries, and there is no longer any reason why they should not find their way into every northern garden.

The Laurels (*Kalmia latifolia*) are beginning to expand their flower-buds and in a few days will be in their best condition. With the fading of these flowers will pass the last of the great floral displays of the Arboretum year.

The Arboretum will be grateful for any publicity given these Bulletins.

ARNOLD ARBORETUM

HARVARD UNIVERSITY

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JAMAICA PLAIN, MASS.

JUNE 20, 1913

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No other North American tree is so familiar to the people of so many different parts of the world as the False Acacia or Yellow Locust of the Appalachian Mountain forests, *Robinia pseudacacia*, and it is now naturalized in many regions far removed from its native home. No other exotic tree has been so generally planted in northern and central Europe since its introduction into the garden of the Paris Museum in 1636 by the King's gardener Robin, whose labors it commemorates; and no other American tree has given rise to such a voluminous literature. The cheerful light green foliage and hanging clusters of fragrant white flowers are known to everyone who has ever looked at trees. The value of the timber which it produces, the rapidity of its growth, its power to adapt itself to different soils and to reproduce itself rapidly by seeds which germinate readily and by stump and root shoots, would make it a most valuable subject for forest and coppice planting in this country if it could be protected from insects, but the value of the Locust is practically destroyed in nearly all parts of the United States beyond the mountain forests which are its home by the borers which riddle the trunk and branches. Owing to the difficulty of keeping the Locust in a presentable condition here no serious effort has ever been made to bring together the interesting varieties or "sports" of this tree which have appeared from time to time in European gardens and are largely planted in European collections of trees. At least thirty of these varieties are now known; the one most often seen in Germany, especially in suburban gardens, is the so-called Parasol Acacia (var. *umbraculifera*). The short branches of this plant form a compact spherical head which is usually grafted on a tall stem of the common Robinia, as in this country a dwarf form of the Catalpa is made into a "standard" by grafting it on a tall stem of the tree form. The only abnormal form of the Robinia thoroughly established in the Arboretum is one of the most remarkable of them all; var. *monophylla*, in which the leaves are reduced to a single broad leaflet.

The two pink-flowered arborescent Robinias, *R. viscosa* and *R. neo-mexicana*, are also subject to attacks by the borer. *R. viscosa*, the Clammy Locust, is not yet in flower but its near relative, the Rocky Mountain species, *R. neo-mexicana*, is now covered with its short clusters of pale rose-colored flowers. More beautiful perhaps than either of these trees is a hybrid of the Rocky Mountain species with *R. pseudacacia*, *R. Holdtii*, named for the Colorado nurseryman in whose establishment it appeared a few years ago. This tree is very hardy; it appears to suffer less than its parents from borers, it grows rapidly and plants only a few feet high cover themselves with pale pink flowers. This tree, which is not yet often seen in eastern collections, is an interesting and valuable addition to the rather short list of trees which flower here in early summer. The Robinias are planted with the other trees of the Pea Family on the right-hand side of the Meadow Road beyond the piece of natural woods.

The latest of the American Magnolias are now in flower, *M. macrophylla* and *M. glauca*. The former is a medium-sized tree with wide-spreading branches and is distinguished by the fact that of all trees which grow beyond the tropics it has the largest leaves and the largest flowers. The leaves of this remarkable tree are silvery white on the lower surface, from twenty to thirty inches long and from eight to

nine inches wide, and the cup-shaped creamy white fragrant flowers are sometimes a foot in diameter. Although an inhabitant of the south, *M. macrophylla* is perfectly hardy in New England, but unless it is planted in sheltered positions the trees often become disfigured by the wind which tears the large delicate leaves. Less showy *M. glauca* is a more valuable plant for general cultivation. Often a large tree in the extreme south, at the north *M. glauca* is never more than a small tree, or more often a large shrub. The leaves are dark green and very lustrous on the upper surface and silvery white on the lower surface; the small, cup-shaped flowers are creamy white and delightfully fragrant, and they continue to open in succession from the middle of June until August. In all North America there is not a more delightful shrub to plant in the garden, or one that will give larger returns in beauty and fragrance; and yet it is difficult to find it in American nurseries, and it is unknown to most American planters of this generation. A hybrid, *M. Thompsoniana*, between *M. glauca* and *M. tripetala*, another American species, is a handsome plant with the general appearance of *M. glauca* but with larger leaves and larger, equally fragrant flowers. This plant is with the American Magnolias on the right-hand side of the Jamaica Plain Gate and is now in flower. Unfortunately it is much less hardy than either of its parents.

On Hickory Path near Centre Street there is a group of large plants of *Styrax japonica* now covered with their pure white cup-shaped flowers hanging gracefully down from the branches on long slender stems; this is one of the handsome flowering shrubs of Japan, but unless a sheltered position can be provided for it, it is not perfectly hardy in the neighborhood of Boston. That it is perfectly at home, where it is now planted in the Arboretum, is shown by the great crops of seedlings which spring up every year under the old plants.

Near this group of *Styrax japonica* are two species of Indigofera, *I. Kirilowii* and *I. amblyantha*, now in flower. The former is a native of Korea and is a low leafy plant which spreads into a broad mass and continues to produce its racemes of large pure pink flowers during several weeks. It was introduced a few years ago into the Arboretum by Mr. Jack, and is an exceedingly valuable garden plant. There is a specimen also of this species in the Shrub Collection. *I. amblyantha* is of entirely different habit, with slender erect stems, small leaves, and erect axillary clusters of small rose-colored flowers which continue to appear during two or three months. An inhabitant of river cliffs in Hupeh at altitudes up to six thousand feet, it sometimes grows there to the height of six feet. This plant flowered in the Arboretum last year for the first time. It appears to be perfectly hardy, and it is one of the most beautiful of the small shrubs introduced by Wilson from western China. Two other species of this genus are established on Azalea Path near its entrance from the Bussey Hill Road, *I. Gerardiana*, a native of the Himalayas, and *I. decora* from southern China. These two plants, although they are killed back to the ground every winter, send up new stems and flower profusely every year. *I. decora* with its large white flowers is a beautiful little plant well worth knowing; it is just coming into bloom.

In the Shrub Collection one of the Roses discovered by Wilson on the mountains of Hupeh, *Rosa setipoda*, is now in flower; it is a large vigorous shrub with broad, many-flowered clusters of long-stalked, dark pink flowers. This Rose proves to be very hardy and promises to be a decorative plant of much value.

Attention is called to another Chinese plant, *Spiraea Henryi*, now flowering in the Shrub Collection and perhaps the handsomest of recent additions to the large number of Spiraeas now cultivated in gardens. *S. Henryi* is a tall, hardy, vigorous shrub with wide-spreading arching branches which on the upper side are covered with large flat clusters of white flowers. Among the Chinese shrubs in the collection of these plants on the south side of Bussey Hill *Hydrangea xanthoneura* and its varieties are in flower; these with *H. Bretschneideri* from northern China are the earliest to flower of all the Hydrangeas which are hardy in this climate.

In the Shrub Collection two of the latest of the Bush Honeysuckles are in flower and are beautiful now and later in the season when the fruit is ripe. These plants are *Lonicera Ledebourii* from the Pacific coast region and *L. involucrata*, var. *serotina* from the mountains of the interior of the continent. The long slender flowers of these two plants are bright yellow more or less tinged with red, and they are surrounded by large, leaf-like dark red cups which remain under the large, black, lustrous fruit. This particular group of Honeysuckles contains some of the hardiest and most beautiful garden shrubs which have been brought into the Arboretum from western North America, a region which has produced few plants which are hardy in this climate.

One of the decorative objects in the Shrub Collection is the large plant of *Halimodendron argenteum*, called Salt-tree because it inhabits the saline steppes near the river Irtysh in Siberia. The pale rose-colored, pea-shaped, fragrant flowers, which are produced in great abundance, are borne in short clusters, and their delicate beauty is heightened by the color of the leaves which are covered with a pale silky down. The plant remains in flower during several weeks.

Among vines of recent introduction *Periploca sepium*, a native of Korea, is worth consideration. This is a plant with slender stems, small pointed dark green and very lustrous leaves, and axillary clusters of long-stalked flowers in which the strongly reflexed, dark brown sepals are the conspicuous feature. It can now be seen, covered with flowers, on the eastern side of the Shrub Collection.

The Himalayan Lilac, *Syringa Emodi*, or as it is sometimes considered a variety of the Chinese *S. villosa*, is now covered with flowers. This is not an occurrence of every year for this species is not perfectly hardy and the ends of the branches and the flower-buds are often killed in severe winters. It is a large, broad shrub with large leaves light yellow green above and silvery gray and covered with soft white hairs below, and long narrow clusters of small white fragrant flowers. It is the last of the true Lilacs to bloom and from all other Lilacs it differs in its light yellow foliage.

Conspicuous plants now in flower in the roadside plantations are the North American *Viburnum dentatum* and *V. cassinoides* and the Japanese *V. dilatatum*, a species with very large, slightly convex clusters of creamy white flowers which are followed in the autumn by small bright red fruits. Other conspicuous plants are the North American *Cornus rugosa* and *C. racemosa*, the European *C. alba*, and two native Roses *Rosa lucida* and *R. humilis*. The flame-colored *Rhododendron* (*Azalea*) *calendulaceum* now makes a brilliant show, and the Laurels (*Kalmia*) are in full bloom. The Laurels can most easily be reached from the South Street or from the Walter Street entrances, and should be visited within a few days.

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It is generally believed that the disease which is now destroying the American Chestnut-tree and the European Chestnuts planted in this country will not attack the Asiatic species. If these trees are really immune they will probably be of much economic importance in the United States. The Japanese Chestnut-tree (*Castanea crenata*) is a common inhabitant of the mountain forests of the central and northern parts of the empire. The Japanese have paid much attention to improving it as a fruit tree and very large chestnuts are sold in the markets of Kobe and Osaka, and are sometimes imported into San Francisco; and nearly as large nuts are raised in great quantities in the neighborhood of the northern city of Awomori. Several of these improved forms of the Japanese Chestnut have long been cultivated in the United States; the tree is hardy in the Arboretum but it does not grow particularly well in eastern Massachusetts, and the climate of the middle states appears better to agree with it. Unless the ravages of the chestnut disease can be checked, it is to China that we must turn for a tree to replace the native Chestnut in New England. Fortunately the common Chestnut of northern and central China (*C. mollissima*) is a tree of good promise here. Raised in the Arboretum from nuts found in Peking by Professor Sargent in 1903 the plants have grown without any check or injury and are now forming tall straight stems and narrow heads. They flowered and produced a few fruits last year and they are now coming into bloom again and look as if they would soon become productive. The other Chinese Chestnut (*C. Vilmoriniana*) is a larger tree and an inhabitant of the mountain forests of western Hupeh where it grows at altitudes between two and four thousand feet above the sea-level. Like the American Chinquapin it has only one nut in a burr. Plants of this noble tree have been raised at the Arboretum from seed collected by Wilson and are growing well, but it is too soon to speak of its hardiness and value in this climate. The Chinquapin (*Castanea pumila*) in the shrubby form common in the South Atlantic states, and in the tree form of the region west of the Mississippi River, from southern Missouri to Texas, is in flower. Although the species is not immune, the plants in the Arboretum have not yet been attacked by the disease. The Chinquapin blooms earlier than the common Chestnut-tree (*C. dentata*) on which the flowers are usually open during the first week of July. The Chestnut collection is on the right-hand side of the Valley Road just beyond the Hickories, going from the Centre Street entrance.

Several Grapevines are in flower and their perfume fills the air. Much time and labor has been expended in forming this collection which is on the trellis at the east side of the Shrub Collection and is one of the most interesting and valuable in the Arboretum. These plants have great decorative value, but their value is still little known to gardeners and it is difficult to obtain many of the species. The value of Grapevines for covering walls can be seen near the Jamaica Plain entrance and on the wall between the Jamaica Plain and Forest Hills entrances, and their value for covering the ground can be seen at the junction of the Meadow and Hemlock Hill Roads, where there are grapevines which are cut back to the ground every spring. All the North American species which are hardy are growing in the Shrub Collection. Among little known species best worth attention are per-

haps *Vitis Doaniana* and *V. cinerea*; the first is a native of the Texas Panhandle and is a fast-growing plant, apparently perfectly at home in New England. The leaves are large and thick, and of a rather pale bluish green color. The fruit grows in small clusters and is covered with a pale bloom. *V. cinerea* grows on river banks in the Mississippi Valley from Illinois to Kansas and Texas. This plant bears very large leaves which are dark green and dull on the upper surface and ashy gray on the lower surface, which, like the young shoots, is clothed when the leaves unfold with a thick, felt-like, gray covering. Some of the other species in the collection which are worth studying from the point of view of the planter of handsome vines are *V. vulpina*, the Frost Grape, the species which grows the farthest north; *V. rotundifolia*, the Muscadine or southern Fox Grape; *V. monticola*, the Sweet Mountain Grape of the limestone hills of southwestern Texas; *V. rubra*, a graceful plant found from Illinois to Missouri, Louisiana and Texas; *V. arizonica*, with small, pale gray-green leaves; *V. aestivalis*, the Summer Grape of the middle states, with large, dark green leaves covered below with rusty brown hairs; *V. bicolor*, of the northern and middle states, a vigorous growing plant with large, deeply-lobed leaves dark green on the upper surface and pale blue-green on the lower surface; *V. labrusca*, the common Fox Grape of New England, with leaves which are covered below with tawny white, tan-colored or red-brown felt, and large berries which vary in color from dark purple to reddish brown or amber color; and *V. cordifolia*, the Frost Grape, an inhabitant of the middle states, with thin leaves light green on both surfaces, and with large clusters of small blue fruits which become edible after frost; this is one of the largest and most vigorous of the American Grapevines, often growing into the tops of the tallest trees and forming stems from one to two feet in diameter.

Among Old World Grapevines the most valuable as ornamental plants here are *V. Coignetiae* and *V. amurensis*. The first is an inhabitant of northern Japan, and is a large plant with enormous, thick, prominently veined leaves pale on the lower surface, which in the autumn turn bright scarlet. This for northern countries is one of the most valuable of all Grapevines. *V. amurensis* is a native of eastern Siberia and, although less vigorous than *V. Coignetiae*, it is a hardy and valuable plant for covering walls and trellises. The Chinese *V. Davidii* is interesting because, unlike other Grapevines, the stems are thickly covered with spines. The leaves of this plant turn bright red in the autumn. Unfortunately in severe winters the stems are killed back to the ground, and it rarely produces fruit in this climate. Equally interesting, perhaps, is another Chinese Grapevine, *V. Pagnuccii*, with leaves which are sometimes shaped like those of an ordinary Grapevine and sometimes are deeply and variously lobed much like those on the Virginia Creeper. There are in the Arboretum a large number of Chinese Grapevines raised from seeds collected by Wilson in western China, but it is still too soon to speak of their value here as ornamental plants.

The earliest Hawthorns (*Crataegus*) are in flower in the Arboretum before the end of April, and the latest of them, the so-called Washington Thorn (*C. cordata*), is now in flower, so that these plants have a blooming period here of at least two months. Their fruits are beautiful during even a longer period, for the earliest Hawthorn fruit is ripe in August and on some species it remains on the branches and retains its shape and color until spring. The Washington Thorn is a native of the

southern Appalachian foothill region and westward to Missouri, and has occasionally become naturalized in the middle Atlantic states from West Chester County, New York, to Delaware. It is a tree sometimes thirty feet high, with erect branches, small, nearly triangular, shining leaves which turn bright scarlet in the autumn, small, dull white flowers in small compact clusters, and small scarlet fruit which remains on the branches until late spring. The late flowers, the brilliancy of the autumn foliage, and the abundance and brightness of the fruit during the winter months, make this one of the most desirable of the American Hawthorns as a garden plant. Several large plants of the Washington Thorn can be seen on the slopes of the overlook near the top of Bussey Hill.

The Silky Cornel, *Cornus Amomum*, is now opening its small white flowers. This has been much used in the Arboretum borders, but in cultivation it is not a satisfactory plant unless it can be given sufficient room for its wide-spreading branches to extend freely and spread over the ground. When crowded by other plants the branches become erect and it loses its real beauty and value. To be seen at its best it should have a clear space with a diameter of not less than twenty feet in which to spread. It is well suited for the front of groups of larger plants; and there is no better shrub to plant by the margins of streams and ponds where its long branches can hang gracefully over the water. Its purple stems are attractive in winter, and the bright blue fruits which ripen in the autumn add to the attractions of this native shrub. In the Cornel Group, at the junction of the Meadow and Bussey Hill Roads, there is a good specimen of this plant and near it are two southern species which will not be in flower for a few days, *C. asperifolia* and *C. stricta*.

Attention is called to one of the new Honeysuckles from western China, *Lonicera Henryi*. This is a plant with long slender stems which, on its native mountains spreads over low bushes and rocks; it has large, dark green pointed leaves, and axillary clusters of flowers which when they first open are rose color but soon turn orange red; they have no perfume. There is a mass of this plant in full flower in the bed of Chinese plants on the southern slopes of Bussey Hill.

The white-flowered Chinese and Japanese tree Lilacs (*Syringa pekinensis* and *S. japonica*), many species and varieties of *Philadelphus*, the native Roses, the fragrant *Rhododendron arborescens*, and the yellow-flowered Woad-wax (*Genista tinctoria*) are now conspicuous in the Arboretum. The last is the plant which covers many hills in Essex County, Massachusetts, where, an escape from cultivation, it has proved a dangerous weed and destroyed much of the value of thousands of acres of land.

The Arboretum will be grateful for any publicity given these Bulletins.

ARNOLD ARBORETUM

HARVARD UNIVERSITY

BULLETIN

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Several of the Oaks of eastern Asia are established in the Arboretum, including all the species of northern Japan, eastern Siberia, northern Korea and northern China. In addition to these there is a large collection of young plants raised from Wilson's seeds collected in western China. These are growing rapidly and appear to be perfectly hardy, but their relationship and names have not yet been determined. There are many evergreen Oaks in southern Japan and southern China, but none of these are hardy in our northern states where only the species with deciduous leaves can be grown. These all belong to the White Oak Group, that is they are species which mature their acorns in one season, all the Black Oaks, which require two seasons for the development of their fruit, being found only in America. There are six Japanese Oaks in the Arboretum; the largest and most valuable of these are *Quercus grosseserrata* and *Q. crispula*. These two trees under favorable conditions sometimes grow in Japan to the height of one hundred feet and produce trunks from three to four feet in diameter. In central Hokkaido these trees form a considerable part of the forest growth and their abundance and the value of the timber which they produce has already attracted the attention of American lumbermen, and it is probable that Japanese white oak timber will become a considerable article of import into the United States. The next species, *Quercus glandulifera*, is perhaps the most widely distributed Oak of Japan and the common species of the high mountains of the central island at elevations over three thousand feet. This is a small tree rarely more than thirty or forty feet tall which sometimes begins to bear acorns when not more than a foot high. The small leaves somewhat resemble those of one of the American Chestnut Oaks. Two Japanese Oaks with narrow leaves, in general outline like those of the Chestnut tree, both hardy here, are interesting on account of their peculiar foliage; the larger of these two trees, *Q. variabilis*, sometimes reaches in Japan the height of eighty feet with a trunk three or four feet in diameter. The under surface of the leaves is silvery white and the bark is thick and corky. This tree is rare in Japan and possibly has been introduced there from China; it is common in Korea and in northern and central China. The bark is sometimes used as cork and the large, thick cups of the fruit are used in the preparation of a black dye and are sold in Chinese markets in large quantities. *Quercus serrata* is a smaller tree with darker bark and the leaves are bright green on the two surfaces. The fifth Japanese Oak in the collection, *Q. dentata*, is remarkable for the great size of the leaves which are often a foot long and eight inches broad, obovate in outline and deeply lobed, and for the long, narrow, chestnut brown scales of the cup which nearly encloses the small acorn. This is a common tree on the mountains of central Japan and ranges far northward and to northern and central China, and, although it grows sometimes to a large size, it is rarely a handsome or picturesque tree. The dark thick bark is used in tanning leather. There is a variety (*pinnatifida*) in the collection with deeply divided leaves.

The plants of *Quercus glandulifera*, *Q. crispula* and *Q. grosseserrata*, although only twenty years old, now produce crops of acorns in the Arboretum. This is important for it is extremely difficult to import acorns from foreign countries in good condition, for they soon lose their vitality unless carefully packed in soil or in sphagnum moss. For this reason the Oaks of eastern Asia are very rare in American

and European collections. *Q. dentata* and *Q. variabilis* have not yet produced fruit in the Arboretum. *Q. serrata* and *Q. aliena* from Korea, and *Q. mongolica* from eastern Siberia and Mongolia are still too young to be productive.

The general collection of eastern Asiatic Oaks is planted on the southern slope of Bussey Hill to the left of the southern end of Azalea Path. Here are plants of the Japanese form of *Q. variabilis*. On the lower side of Azalea Path there is a good specimen of *Q. glandulifera* and a specimen of *Q. grosseserrata*. Near the southern end of Oak Path there is the largest specimen of *Q. variabilis* in the collection. This tree was raised from seed sent from Peking in 1882. Near this tree are young plants of *Q. serrata* and two plants of *Q. dentata*. Several specimens of *Q. glandulifera*, *Q. crispula* and *Q. grosseserrata* can be seen in the mixed plantation along the road at the top of Peter's Hill, and there is a group of these three species on the steep slope rising from the Parkway directly opposite the Forest Hills entrance to the Arboretum.

The Oaks of Europe do not often flourish in New England. None of the species of the Mediterranean region are hardy here; and although the two common Oaks of western Europe, *Q. pedunculata* and *Q. sessiliflora* are hardy and grow rapidly in this country for a few years, they are short-lived here and not to be depended on. It is possible, however, that the Hungarian Oak, *Q. conferta*, or as it is often called, *Q. pannonica*, may prove an exception to this general rule in regard to European Oaks as the climate of eastern Europe with its cold winters and hot dry summers is not as unlike that of eastern North America as the climate of western Europe. *Q. conferta* is a large and valuable timber tree with large, dark green, deeply lobed and lustrous leaves; it grows rapidly and is very hardy here, but it is too soon to speak of its permanent value or to say more than that it is a tree which deserves a more general trial in this country than it has yet received. The largest specimen in the neighborhood of Boston can be seen in the Arboretum on Oak Path near the Japanese *Q. dentata*.

The black-fruited *Sambucus canadensis* and its varieties are in bloom in the Shrub Collection and the common form is conspicuous along the Bussey Brook; and, although these Elders are now in full bloom, the brilliant red or orange fruits of the early-flowering species, *S. pubens* of North America and the Old World *S. racemosa* are nearly ripe. As a foliage plant the most beautiful of these red-fruited Elders is probably the Japanese *S. racemosa*, var. *Sieboldii*, which is well established with the other Elders in the Shrub Collection.

The brilliant fruits of some other plants are already conspicuous in the Arboretum, notably of some of the Bush Honeysuckles. These plants produce fruit in great quantities and it remains in good condition for several weeks, and as the different species ripen their fruit from early summer to the beginning of October their second period of beauty is a long one. On different species or hybrids the fruit is blue, black, orange, or scarlet, and these beautiful and abundant fruits following beautiful flowers make them desirable garden plants, especially in the northern United States where they are very hardy and where they appear to bloom more freely than in other parts of the world. No group of shrubs in the Arboretum is more worthy of the careful attention of persons who desire to plant hardy, fast-growing shrubs beautiful when covered in spring with innumerable flowers or in early summer when their showy fruits are ripe.

Some other plants in the Shrub Collection are now in their greatest beauty. Among these two yellow-flowered plants of the Pea Family, *Cytisus capitatus* and *C. nigricans*, are well worth attention, especially the latter which is a small, slender shrub with erect racemes of large flowers, and perhaps the most beautiful of the genus which can be successfully grown here. *Colutea arborescens* from southern Europe, and *C. cilicica* from Asia Minor, also of the Pea Family, are just now in great beauty, for they are still covered with their bright yellow flowers; and these are mixed with the large inflated pods developed from earlier flowers and now more or less deeply tinged with rose color.

The first of the Hypericums to flower in the collection and one of the gems of the genus, *H. Buckleyi*, is now opening its flowers. It is a dwarf plant growing here only a few inches high but spreading into a broad mat which becomes covered with yellow flowers and as these remain in good condition for a long time, it is well suited for a sunny position in the rock garden.

Attention is called again this year to the hybrid *Lonicera Heckrottii* which is now in bloom. The flowers, although not fragrant, are very beautiful, the outer surface of the corolla being deep rose color and the inner surface pale yellow, both buds and open flowers occurring together in the same cluster. This is the only plant in the Arboretum which is really a continuous bloomer. Last year the first flowers opened at the end of June and flowers continued to open until November.

The Yucca of the high plains at the eastern base of the southern Rocky Mountains, *Y. glauca*, is in bloom for the first time in the Arboretum. The Heather (*Calluna vulgaris*) with its numerous varieties is already opening its purple and white flowers and promises abundant bloom in the Shrub Collection and among the Rhododendrons at the base of Hemlock Hill. The latest of the Viburnums to flower and one of the most conspicuous plants now in bloom in the Arboretum is *V. Canbyi*. This is a magnificent plant in cultivation if sufficient space is given to it for free development when it will grow rapidly into a round-topped shrub ten or twelve feet high and broad. The last of the Rhododendrons (*R. maximum*) is now in flower, and the latest of the Azaleas (*R. viscosum*), the so-called Swamp Honeysuckle of our eastern coast region, is opening its fragrant white flowers. The Spice Bush, *Clethra alnifolia*, which has been largely planted in the roadside shrubberies, is still to flower. Only the earliest of the Linden trees have opened their fragrant flowers, and during several weeks the other species and hybrids of these handsome trees will be in flower. Other interesting trees will flower still later and will well repay weekly visits to the Arboretum. Of these late-blooming trees may be mentioned the North American Sorrel-tree, *Oxydendrum arboreum*, and the North American Hercules' Club (*Aralia spinosa*). These two trees are among the Laurels at the base of Hemlock Hill. The arborescent Aralia of eastern Asia (*A. chinensis*) and *Acanthopanax ricinifolius* of the same Family, with its large tropical looking leaves and great clusters of small white flowers are in the Aralia Group near the junction of the Meadow and the Bussey Hill Roads. Another tree still to flower is the Chinese *Koelreuteria paniculata* with its large erect clusters of bright yellow flowers and to be seen on the Meadow Road. Other Asiatic trees to flower are *Sophora japonica* and *Maackia amurensis* which are established with the other trees of the Pea Family on the right-hand side and near the Bussey Hill Road.

These bulletins will now be discontinued until the autumn.

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Persons interested in the plants best suited for the decoration of parks and gardens of eastern North America can find much to learn in the Arboretum from this time until the end of the year, for it is in the autumn that conifers are seen to the best advantage and that the mature leaves of the few broad-leaved evergreens which flourish in this climate best show the beauty and value of these plants for the late autumn and winter garden. Perhaps nowhere else in the world are so many different plants with brilliant autumn foliage and handsome and abundant autumn fruits assembled as in the Arboretum; and in no other garden can such plants be so easily and conveniently studied. Such plants give a character and beauty to the autumn garden which can be found only in eastern North America and perhaps in Japan where the leaves of many of the native trees and shrubs assume brilliant colors before they fall. In the Arboretum the autumn foliage of many Japanese plants is as brilliant as it is in their native country, but it is still to be shown if that of American plants cultivated in Japan is as beautiful there as it is in our eastern states.

The earliest of the American trees to change the color of its leaves this year is the Red or Scarlet Maple, *Acer rubrum*. On trees growing in swamps the leaves are now often bright scarlet, while on trees growing on higher and drier ground the leaves are still bright green or only slightly tinged with red. The so-called Water Willow, *Decodon verticillatus*, perhaps better known as *Nesaea*, is a native of all the region from Maine to Florida and Louisiana, and is a shrub with arching stems from two to three feet long growing only in the wet often submerged borders of streams and ponds where it often spreads into broad thickets. The flowers and fruits are not conspicuous, but the stems hanging over the water make an interesting and attractive margin to a shallow pond or sluggish stream, and in early autumn the leaves turn bright scarlet, so that for a few weeks the plants are conspicuous among the green sedges and swamp grasses with which they are usually associated. It is not probable that the Water Willow is often cultivated, but it is now well established in the Arboretum along the margins of two of the little ponds near the junction of the Meadow and Bussey Hill Roads.

The leaves of some of the forms of the so-called Virginia Creeper of eastern North America are already bright scarlet. The earliest to adopt its autumn dress and now in brilliant color is *Parthenocissus vitacea*. This plant rarely has adhesive discs at the ends of the tendrils, so that it cannot attach itself to the trunks of trees or to brick and stone walls like *Parthenocissus quinquefolia*, which is often sold in nurseries as *Ampelopsis Engelmannii*. Of this plant there are several varieties recognized by botanists. On the variety *hirsuta* the young branches, tendrils and leaves are covered with soft down, and a form of this variety which grows in the neighborhood of Ontario in Canada appears to be the best of all the Virginia Creepers for covering brick walls. Fine plants of this form can be seen on some of the buildings at the Central Experimental Farm of the Dominion of Canada at Ottawa. The variety *San Paulii*, which is the common form in Illinois and Missouri, also attaches itself to walls and grows rapidly to a great

height. Nearly all the forms of the Virginia Creeper can now be seen on the trellis at the eastern side of the Shrub Collection and near the entrance from the Forest Hills Gate.

One of the handsomest shrubs in early autumn is the Japanese *Evonymus alatus*, for the leaves of this plant turn a delicate rose color unlike those of any other plant in the Arboretum. This *Evonymus*, with abundant room, spreads into a compact round-headed shrub from four to six feet tall and ten or twelve feet in diameter. The fruit is small and less conspicuous than that of many species of *Evonymus*. The broad or sometimes narrow corky wings of the branches make it conspicuous in winter. There is a good specimen in the *Evonymus* Group on the Meadow Road, and a large isolated specimen in the grass border of the Bussey Hill Road above the Lilac Group.

The earliest of the *Opulus* Group of *Viburnums* to change the color of its leaves is the eastern Asiatic *Viburnum Sargentii*, and on some individuals of this species the leaves are already dark red. Of the three species of this group this is the handsomest in flower, for the sterile flowers which surround the clusters of perfect flowers are larger than those of the eastern American or of the European species, but the fruit is small, dull in color and of little value.

Another plant from northeastern Asia, *Acer ginnala*, is beautiful in the autumn when the brilliant scarlet of the fading leaves of this small tree is hardly surpassed by that of any American tree or shrub. Among Maples *Acer ginnala* is interesting on account of the fragrance of the flowers, fragrant Maple flowers being unusual. It is a native of eastern Siberia, and has proved very hardy in the northern states, and in Quebec and Ontario.

Bright scarlet now are the leaves of *Rosa nitida*. This little Rose, which grows naturally on the margins of swamps from Newfoundland to New England, is perhaps the most beautiful of our native Roses and very distinct in the bright red prickles which thickly cover the stems and branches; it is too rarely cultivated.

A few of the fruits which ripen in early autumn are already conspicuous. There is perhaps no shrub more beautiful in the Arboretum at this time than one of the American Cornels, *Cornus rugosa*, or, as it is sometimes called, *C. circinata*. This is a tall, broad, round-headed shrub with greenish branches and round-oval, dark green leaves. The flowers are not more showy than those of other Cornels, but the clusters of light blue fruits on red stalks which now cover the plants make them objects of much interest and beauty. There are several plants of this species in the Cornel Group at the junction of the Meadow and Bussey Hill Roads, and there are large masses of it among the Hickories on the Valley Road. The finest individual plants, however, are on the slope where the *Celtis* collection is planted, on the right-hand side of the path which follows the north side of the Bussey Hill Road. The red Osier Cornel or Dogwood, *Cornus racemosa*, often called *C. stolonifera* or *C. candidissima*, is also beautiful at this season, for the leaves are beginning to turn dark red and the plants are covered with abundant clusters of white fruits on bright red stalks. There is a large mass of this plant in the Cornel Group and it has been largely planted in the mixed plantations along the drives. Spreading rapidly into large dense clusters, with good foliage, abundant flowers and beautiful fruits, few shrubs are more desirable for park or roadside plantations.

The two eastern American species of Mountain Ash, *Sorbus americana* and its variety *decora*, are covered with large clusters of scarlet fruit which remain on the branches in brilliant condition until after the leaves have fallen and until late in the season when they are eaten by the robins. These plants are on the border at the eastern end of the Shrub Collection and near the entrance from the Forest Hills Gate. In the same border several species of American Hawthorns are now bearing large crops of scarlet fruits, notably *Crataegus succulenta*, *C. prunifolia*, and *C. rotundifolia*. On some of the American Hawthorns the fruit ripens soon after the middle of August and has already disappeared; on other species it will continue to ripen during the next two months, and the fruit of a few species will retain its beauty until spring. Many of the young plants in the general collection of Hawthorns on Peter's Hill, are fruiting this year, and among them one of the Colorado species (*C. colorado*) is conspicuous from the abundance of its bright red fruits which ripen early in September. The decorative value of the American Hawthorns is hardly realized yet, although few small trees or shrubs produce more beautiful flowers or handsomer or more abundant fruits.

The collections of Grapevines on the trellises at the eastern side of the Shrub Collection is now in excellent condition and is one of the most complete and successful groups in the Arboretum. Persons interested in hardy vines or desirous of seeing the decorative value of our native Grapevines should lose no time in visiting this collection for the first severe frost kills the leaves of these plants. All the species of eastern North America, except two or three from the extreme south, are represented in the collection and they all have value as ornamental plants. Of the species which are not often seen in cultivation attention is called to *Vitis Doaniana* from the Texas Panhandle, *V. bicolor* from eastern New York and southward, and *V. arizonica* with its small pale gray-green leaves. The Japanese *Vitis Coignetiae* is perhaps a more vigorous plant than any of the American species, although probably *V. cinerea* and *V. aestivalis* growing on the rich bottom-lands of the Mississippi valley reach a greater height than this Japanese vine, but in the size of its thick dark green leaves which are sometimes a foot in diameter, in its vigor, rapid growth and massive appearance it has no equal among the Grapevines which have been grown in the Arboretum. In northern Japan the leaves turn bright scarlet before falling, but the earlier frosts of the American autumn, which is a month earlier than the autumn of Japan, generally destroy the leaves while they are still green.

The season for flowers in the Arboretum is practically ended for the year, although one of the new Chinese shrubs, *Indigofera ambliantha* is still covered with its erect spikes of small rose-colored flowers. This is a small perfectly hardy shrub with erect stems, which, beginning to flower the middle of July, continues to produce its flower clusters until October. Among summer-flowering shrubs this is certainly one of the most beautiful of recent introduction.

The Arboretum will be grateful for any publicity given these Bulletins.

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Harvard University

No. 50

ARNOLD ARBORETUM

HARVARD UNIVERSITY

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JAMAICA PLAIN, MASS.

OCTOBER 30, 1913

BULLETIN NO. 50.

The exceptionally wet and cloudy weather of October has lessened the beauty of the fading leaves of many trees and shrubs in the Arboretum this autumn. From some American plants the leaves have fallen with little change of color, on others the colors are dull, and on many plants which are usually brilliant the first of November the leaves are still green and will probably be destroyed by the first serious frost before assuming their usual autumn colors. There are, of course, many exceptions to this general statement. The clear yellow tints of the leaves of the Japanese *Cercidiphyllum* have never been more beautiful than during the past few weeks. From some of the trees the leaves have already fallen or are falling rapidly, on others they are yellow, and on others still green or only slightly turned. As this tree is better known in this country its value is more appreciated. First introduced into the United States by the Arboretum in 1878, *Cercidiphyllum* has become thoroughly established in several collections in the neighborhood of Boston and has flowered and produced abundant crops of seeds here for several years. *Cercidiphyllum* is the largest tree of extratropical Asia, growing often to the height of one hundred feet or more and forming an enormous trunk composed of a number of secondary stems. The trees are fastigate in habit with erect branches and slender branchlets, and the flowers and fruit are inconspicuous. The leaves somewhat resemble those of the Redbud or *Cercis* in shape, whence the name *Cercidiphyllum*. As they expand in very early spring, they are a dark bronze-red in color, and during the summer are rather dull blue-green. There are a number of these trees on both sides of the Meadow Road just beyond the Administration Building.

A plant of much beauty at this time owing to the dark wine color of its ripening leaves is the Japanese *Stuartia pseudocamellia*. This is a small slender tree common on the mountain slopes of central Japan, belonging to the family to which the Tea-plant and the Camellia belong. The white, cup-shaped flowers resemble those of a single-flowered Camellia; they are smaller, however, than those of the two American *Stuartias*, *S. pentagyna* of the Appalachian Mountains and *S. virginica* of the southeastern states. These are both shrubs, and the flowers of the latter are larger and more beautiful than the flowers of the other *Stuartias*, but this handsome plant is not hardy in New England and is now rarely found in European gardens, although it was introduced into England more than a century ago and appears to be perfectly hardy in the neighborhood of London. *Stuartia pentagyna* is perfectly hardy here and is one of the most desirable of the summer-flowering shrubs which can be grown in this climate. It is a large, free-flowering shrub and there is a form with bright purple stamens which make the flowers more conspicuous than those of the common form with yellow stamens. There is a good plant of the Japanese species on the upper side of Azalea Path, and there are plants of this and of *Stuartia pentagyna* in the Shrub Collection.

The three species of the eastern American genus *Aronia*, or Chokeberry, are beautiful plants in the autumn. Some of the forms of *Aronia nigra* are the largest in this group, sometimes growing to the height of eight or ten feet. The shining black fruit of these plants,

hanging in large and abundant clusters, contrasts well with the red and orange tints of the autumn leaves. *Aronia intermedia*, of the same general appearance, has earlier ripening, dark wine-colored fruit, while *A. arbutifolia* has erect clusters of smaller fruit and narrower leaves which are bright scarlet before falling. This plant late in the autumn is one of the showiest of all the shrubs of eastern North America. All the *Aronias* are easily cultivated and excellent garden plants; the flowers are abundant and handsome, and they have great value for the decoration of the autumn garden.

The leaves of no other shrub in the Arboretum are now so bright scarlet as those of the common Highbush Blueberry of New England swamps (*Vaccinium corymbosum*). This plant has much to recommend it for general cultivation; the habit is good, the flowers are beautiful, the large bright blue fruits which cover the branches in early summer are very handsome and of better quality than those of any other Blueberry, and the autumn foliage is unsurpassed in brilliancy. Young plants can be easily transplanted from the swamps and succeed in any good garden soil in which they grow rapidly and flower and produce fruit in abundance. The Highbush Blueberry has been largely planted in the Arboretum shrubberies and there is a group of these plants on both sides of Azalea Path at its entrance from the Bussey Hill Road at the base of the Overlook.

Some of the new Cotoneasters discovered by Wilson in western China are shrubs of much beauty at this season of the year, and among them are several of the handsomest and most desirable garden shrubs of recent introduction. Some of the species grow six or eight feet high and some form dense mats of prostrate stems: some have bright red and others shining black fruits, and nearly all of them have dark green and very lustrous leaves which retain this color until the late autumn. One of the handsomest plants of this group is *Cotoneaster hupehensis* with erect and spreading stems, larger and more conspicuous flowers than those of other species of Cotoneaster, and exceptionally large red fruits which have already fallen. *Cotoneaster foveolata* is a tall shrub with black fruit and leaves which turn late in the autumn to brilliant shades of orange and scarlet. For its autumn foliage this plant might well find a place in every garden. Although no longer a novelty, *Cotoneaster horizontalis* is one of the most useful and interesting of the Chinese species of Cotoneaster. It is a low plant with spreading and arching stems which in time form a broad mat not more than a foot high. The small leaves are dark green and very lustrous: the minute flowers are dark red and these are followed by innumerable small red fruits. This is a most desirable plant for the borders of small shrubberies, for the rock garden and for covering low walls. A collection of several species of the new Chinese Cotoneasters can be seen in the long bed of new Chinese plants on the southern slope of Bussey Hill, and there is a large specimen of *C. horizontalis* on the upper side of Hickory Path near Centre Street which is now covered with fruit and well shows the decorative value of this plant.

Unfortunately only a few species of the genus *Callicarpa* are hardy in this climate, and the beautiful *C. americana*, the so-called French Mulberry, which makes such a brilliant display in the southern woods at this season of the year with its large clusters of rose-purple fruit, cannot be grown here. The decorative value of plants of this genus

for the autumn garden can now be seen, however, at the entrance of Azalea Path from the Bussey Hill Road where there is a group of *Callicarpa japonica* covered with the small, shining, light purple fruit of this hardy little shrub. There are two forms of this plant in the group, the larger, with larger fruit having been raised from seed collected in Corea, and the smaller plants with smaller fruit raised from seeds gathered on the mountains of Japan.

Almost as conspicuous as the fruit of this *Callicarpa* is that of the Japanese *Symplocos crataegoides*, although it is still somewhat hidden by the ample foliage of the plant. This native of Japan is one of the few shrubs with bright blue fruit which can be grown in this climate. It is a large and perfectly hardy shrub which in late spring is covered with clusters of small white flowers and these are followed by small fruits which in the early autumn become bright blue and remain in good condition on the branches until after the leaves have fallen. Large plants of this *Symplocos* can be seen on the Bussey Hill Road above the Lilac Group, and it is in the Shrub Collection.

The fruit of most of the Bush Honeysuckles ripens and falls in summer, but a conspicuous exception to this general statement is found in *Lonicera Maackii* and its variety *podocarpa*. *Lonicera Maackii*, which is a native of the Amoor River region in northeastern Asia, is a large shrub with erect stems and white flowers which are larger and perhaps more beautiful than those of any other Bush Honeysuckle. The fruit of this plant is bright red, of medium size, and remains on the branches after the leaves have fallen, making it a valuable decorative plant in the late autumn. The flowers of the variety *podocarpa* which was discovered by Wilson in western China, are smaller, tinged with yellow or rose color, and less beautiful, but the fruit is larger and the leaves remain much later without change of color on the branches. At this time, therefore, the plant is covered with bright green leaves and bright red or orange fruit, making it one of the most attractive shrubs in the Arboretum at this season. There are large specimens of the Chinese and Siberian plants side by side in the Shrub Collection, and there are plants of the latter also covered with fruit in the Chinese collection on the southern slope of Bussey Hill.

An illustrated guide to the Arboretum containing a map showing the position of the different groups of plants has recently been published. It will be found useful to persons unfamiliar with the position of the different groups of plants. Copies of this guide can be obtained at the Administration Building in the Arboretum, from the Secretary of the Massachusetts Horticultural Society, 300 Massachusetts Avenue, Boston, from The Houghton, Mifflin Company, 4 Park Street, Boston, at the Old Corner Bookstore, Bromfield Street, Boston, and at the office of the Harvard Alumni Bulletin, 50 State Street, Boston. Price, 30 cents.

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No. 51

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JAMAICA PLAIN, MASS.

NOVEMBER 7, 1913

BULLETIN NO. 51.

Three species, at least, of Hawthorns show their greatest beauty in early November. These species are *Crataegus cordata*, *C. nitida* and *C. persistens*. The first of these plants, the so-called Washington Thorn, is a narrow, rather slender tree which in favorable situations grows to the height of twenty or thirty feet. The leaves are nearly triangular in outline, of medium size and very lustrous. The flowers, which open about the middle of June, are small, creamy white, and are produced in small, compact but very numerous clusters; these are followed by small, scarlet, shining fruits which ripen late in October and remain on the trees without change of color until the spring. As the fruit assumes its bright color the leaves turn gradually to brilliant shades of orange and scarlet. This tree, therefore, which is much less beautiful when it is in flower than many other Hawthorns, is surpassed in the late autumn by few members of the genus. *Crataegus cordata* is a native of the southern Appalachian region from Virginia to Alabama, and is also abundant in southern Missouri. Formerly much cultivated as a hedge plant in the middle states, it is now sparingly naturalized in eastern Pennsylvania and in Delaware. The largest plants of this Hawthorn in the Arboretum are on the side of the Bussey Hill Overlook, and there is a good plant on Hickory Path near Centre Street. *Crataegus nitida* is a native of the bottom-lands of the Mississippi River in Illinois opposite the city of St. Louis, and is a larger tree of entirely different habit. The branches are wide-spreading and slightly pendulous, and form a large, rather open, round-topped head. The leaves are narrow, long-pointed and very lustrous, and, as is often the case with American Hawthorns, those at the ends of the branches are usually two or three times larger than the leaves on fertile branchlets. The flowers are pure white, of medium size, and produced in very numerous clusters which cover the upper side of the branches. The scarlet drooping fruit, which is also of medium size, ripens late just as the leaves turn orange and scarlet. In habit, in brilliancy of foliage, in its autumn colors, and in its abundant flowers and showy fruit *Crataegus nitida* is one of the handsomest of the American Hawthorns which has grown to a large size in the Arboretum. There are several good specimens of this tree on the bank on the east side of the Shrub Collection. *Crataegus persistens* retains its leaves which are now as green as they were at midsummer, after those of all the other Hawthorns have fallen, and the crimson fruit remains without change of color on the branches until late in the winter, making this tree the most conspicuous of all the winter-fruited plants which have yet proved hardy in New England. This tree in habit and in the shape and general appearance of the leaves resembles some of the Cockspur Thorns of eastern North America. Raised at the Arboretum from seeds sent from the Paris Museum, its native country is still unknown. No plant at all like it has been found in the United States, although it is certainly a species of the New World. The fact that it retains its leaves so late in the autumn indicates a southern origin, and, if it is not a hybrid, it is possible that it may still be found in some of the elevated valleys of central Mexico. But whatever its origin, this is a tree of perfect hardiness and exceptional ornamental value. The

largest plant in the country and the type of the species can be seen among several large Hawthorns at the foot of the bank on the park-way near the Forest Hills entrance of the Arboretum, where it can be easily recognized as it is now the only plant in this collection with perfectly green leaves. Here, too, are several good plants of *Crataegus nitida*.

Unfortunately the European Holly, *Ilex Aquifolium*, and its numerous varieties which are splendid ornaments of parks and gardens in more temperate regions, is not hardy in New England. This is also true of the evergreen Hollies of China and of the broad-leaved evergreen species of southern Japan, and only three species of these plants can be grown here. These are the red-fruited *Ilex opaca* of the eastern United States, and the black-fruited *I. glabra* and *I. crenata*. *Ilex opaca* is interesting as it is the only broad-leaved evergreen tree which is hardy in New England. In general habit and in its fruit it resembles the European species, but on this American tree the leaves are dull and not lustrous like those of the European species. The bright red berries remain on the branches through the winter, however, and make it an ornamental tree here of the first class. There are several specimens in different parts of the Arboretum, and a large plant now covered with fruit among the Laurels at the northern base of Hemlock Hill. *Ilex glabra* is a round-topped shrub occasionally five or six feet high and is very common on sandy land in the neighborhood of the coast from New England to Texas. It is very hardy and is chiefly valuable for its small shining leaves which nearly completely hide the small black fruits which remain on the branches during the winter. This is certainly one of the most valuable of the evergreen shrubs which can be grown in this climate. A fine mass of it can be seen on the Bussey Hill Road opposite the Laurels at the northern base of Hemlock Hill. *Ilex crenata* is a taller growing and narrower plant than *I. glabra*, with darker green leaves and rather larger fruits. The leaves vary greatly in size on different individuals, and the plants with smaller leaves have proved hardier in the Arboretum than the broader-leaved forms. There are several plants of this Japanese Holly on Azalea Path which have grown to their present size from seeds planted here twenty years ago.

The number of broad-leaved evergreen shrubs which can be grown in this climate is small, but the leaves of a few deciduous-leaved species are not injured by early frosts and remain green so late in the season that they are valuable for the autumn garden. One of the most useful of these plants is the European Privet, *Ligustrum vulgare*, a plant formerly much cultivated in this country and now occasionally naturalized in the eastern states. The leaves are now as dark green as they were at midsummer, and their beauty is increased by the larger handsome clusters of shining black berries on the ends of the branches. This is a large, very hardy and fast-growing shrub which in recent years has been somewhat overlooked owing to the introduction of numerous Japanese and Chinese Privets which are all, however, far less valuable ornamental plants. There is a form of the European Privet with yellow fruits which is not particularly handsome, and forms varying from the normal plant in habit. They can all be seen in the Shrub Collection.

A Evonymus known as *E. Hamiltonianus*, var. *semipersistens*, a shrub of uncertain origin but probably Chinese, is valuable because the leaves are still as green as they were early in the season. The flowers of this plant, like those of all the species of Evonymus, are small, and the fruit is unusually small, inconspicuous and late ripening; and it is only for the green of its leaves in late autumn that this plant is valuable. A good specimen can be seen in the Evonymous Group on the right-hand side of the Meadow Road. All the forms of the common Lilac (*Syringa vulgaris*) are still as green as they were at midsummer, and the leaves of *Magnolia glauca* are still nearly as bright and shining as they were two months ago.

The mild winter and the abundant rains of the early spring, and of October have been favorable to conifers, and many of the trees in the Pinetum have never looked better than they do today. This, of course, is not a good climate for conifers and some of the most beautiful and interesting of these trees cannot be grown here at all, including nearly all the species from western North America and those from the southern United States and Mexico. The coniferous trees of the countries of the Mediterranean Basin, and of South America, Tasmania and New Zealand, too, are not hardy here. Those of northeastern North America and the Rocky Mountains are the species on which we can best depend, and among these the White Pine, the Red Pine, the Canadian and the Carolina Hemlocks, the Red Cedar, the Arborvitae, the Colorado White Fir (*Abies concolor*), the Colorado Douglas Fir (*Pseudotsuga Douglasii*) can be counted among the most beautiful conifers in the world. All the species of central and northern Europe are hardy here but are often short-lived. So far as it is possible to judge by an experience only of from twenty to thirty years all the Siberian and north of China conifers are promising here, as are nearly all the Japanese species, although some of these are more valuable ornamental trees here than others. Of the great number of new conifers recently raised here from seed collected in western China, the most important probably of all the Arboretum introductions it is still too soon to speak, but, judging by the climate where these trees grow, it is not improbable that some of these Firs and Spruces may succeed in New England.

These bulletins will now be discontinued until the spring.

An illustrated guide to the Arboretum containing a map showing the position of the different groups of plants has recently been published. It will be found useful to persons unfamiliar with the position of the different groups of plants. Copies of this guide can be obtained at the Administration Building in the Arboretum, from the Secretary of the Massachusetts Horticultural Society, 300 Massachusetts Avenue, Boston, from The Houghton, Mifflin Company, 4 Park Street, Boston, at the Old Corner Bookstore, Bromfield Street, Boston, and at the office of the Harvard Alumni Bulletin, 50 State Street, Boston. Price, 30 cents.

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JAMAICA PLAIN, MASS.

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BULLETIN NO. 52.

The winter of 1913-14 will be remembered in all parts of eastern North America as a winter of exceptional severity. The unusually low temperature accompanied by high gales of a day or two in January when there was no snow on the ground, and the severe cold and high winds of late February and early March caused much anxiety to the lovers of plants in eastern Massachusetts. So far as the Arboretum is concerned these fears have not been realized, for the losses from the winter here are few and unimportant. The plants of a small *Rhododendron*, *R. Gowenianum*, chiefly interesting as one of the hybrids between an *Azalea* and a *Rhododendron*, have been killed; otherwise the *Rhododendrons* are in remarkably good condition and their flowering promises to be the best that the Arboretum has seen. A few of the small, half hardy conifers, like some of the *Torreya*s and *Cephalotaxus* planted near the top of Hemlock Hill, have suffered but will probably recover, and here and there through the Arboretum the dead tips of small branches show how severe the winter has been. Even small plants of *Buckeyes* from Georgia and Texas, and several species of *Plums* from Texas planted in the open ground, show no signs of injury.

The effects of the cold on the new plants from western China are of special interest for it would seem that any plant that could survive such a winter might be considered hardy. It is gratifying, therefore, to find that very few of the Chinese plants even when planted in the most exposed positions have suffered. The *Oaks*, *Birches*, *Poplars*, *Willows*, *Ashes*, *Cherries*, *Plums*, *Yellowwoods*, *Davidias*, *Eucommia*, *Catalpas*, *Berberis*, *Cercidiphyllum*, most of the *Cornels*, *Viburnums*, *Cotoneasters*, *Honeysuckles*, *Spiraeas*, *Lilacs*, several of the *Evodias* and *Ehretia* and many others are uninjured. Some of the Chinese *Roses*, as might have been expected, are killed back nearly to the ground, while others are quite unhurt. Two of Wilson's conifers, *Picea Watsoniana* and *Tsuga chinensis*, have been growing for three years in the open ground without protection and are now as bright and fresh as any conifer in the collection. This is interesting for these two trees came from the region where Wilson later found the large number of new conifers, the introduction of which into cultivation was one of the important results of his travels, and the hardiness of this *Spruce* and *Hemlock* indicate that other species from the same region may perhaps be equally hardy in New England.

It is interesting to note that the flowers of the winter-flowering *Witch Hazels* from southern Missouri, Japan and western China were not affected by the severe cold. The Chinese species, *Hamamelis mollis*, produced its flowers for the first time in the Arboretum in February. These flowers are larger than those of the other species; the petals are bright yellow and remained for weeks in good condition. This promises to be a valuable plant for persons who can use winter-flowering shrubs.

The spring is exceptionally late. The bluebirds did not arrive this year until March 25th; they have been known to come as early as the 21st of February, and the average date of their arrival for the last thirty years is March 9th. In the bulletin published last year on April 25th there was announced the flowering of several *Cherries*, of the

Amelanchiers, of some of the Forsythias, and of other plants which are now only just beginning to enlarge their buds. A week later the Japanese *Euptelea polyandra* was in flower, and the branches of the Chinese *Prunus tomentosa* were already covered with its handsome flowers.

In spite of the lateness of the season several trees and shrubs, however, are already in flower. The branches of the White Elm, *Ulmus americana*, the earliest of the Elm trees to open its buds here, have been brown for several days with the clusters of its small flowers, and the Scarlet Maple (*Acer rubrum*) is gay with its crowded flowers which cover its otherwise naked branches and are on some individuals scarlet and on others pale red or yellow.

The earliest exotic tree to flower this year is the European Dogwood or Cornel, *Cornus mas*, often called the Cornelian Cherry. The small bright yellow flowers in dense clusters now cover the leafless branches and make the plants conspicuous in early spring. The leaves, which will unfold as the flowers fade, are abundant, of good size and pleasant color, and the bright scarlet lustrous fruits, which are the size of large cherries but oblong in shape, hang gracefully on slender stems and are very ornamental. This small tree is perfectly hardy and probably was better known and more generally planted fifty years ago than it is now. The plant in the Arboretum in the Cornel Group, at the foot of the Bussey Hill Road, is not flowering particularly well this year, but many specimens can be seen in the shrubberies of the Boston parks now in full flower; and there is an exceptionally large and shapely tree on the Boylston Street side of the Boston Public Garden near the entrance to the Subway.

Many of the Alders are in flower and their delicate blossoms will well repay careful examination. The flowers of several Willows in the collection planted along the eastern border of the great meadow are now open, and during the next two weeks others will appear in succession. It is at this period that these trees and shrubs are seen in their greatest beauty and are most interesting to the student.

The Spice Bush (*Benzoin aestivale*) is just opening its flowers and can be seen to advantage in the large group on the right hand side of the Bussey Hill Road opposite the end of the Lilac Group. This is a native of the eastern United States and an inhabitant of the borders of swamps where it sometimes grows to the height of ten or fifteen feet. The flowers are small, bright yellow, and the male and female flowers are produced on different individuals, so that some of the plants only bear the small, scarlet, shining fruits which contrast so well with the bright yellow autumn foliage. The leaves are fragrant like those of its relative, the Sassafras, and are not injured by insects. The Leatherwood Group (*Dirca palustris*) which can be seen on the right-hand side of the Bussey Hill Road just above the Spice Bushes, is now covered with its beautiful small yellow flowers. This is one of the most successful groups in the Arboretum and should be visited by persons interested in early spring flowering shrubs of good habit and entire hardiness.

The earliest Magnolias are just opening their flower-buds in the neighborhood of the Administration Building. These are two Japanese species, *Magnolia stellata*, *M. kobus* and its northern form var. *borealis*. These plants, like many other Asiatic species, open their flowers before

the leaves appear. The former is a shrub which may in time be expected to grow to the height of ten or twelve feet and to spread to a diameter equal to its height. It is perfectly hardy and one of the most beautiful of all early spring flowering shrubs but, like several of the other early flowering Magnolias, it blooms too early and the flowers are often injured by late frosts. This is true, too, of *Magnolia kobus* and its variety. The latter is a larger and more vigorous tree than the typical *Magnolia kobus*, which in the Arboretum has remained shrubby in habit. These two plants, in their young state at least, do not produce large quantities of flowers and their flowers are less beautiful than those of many Magnolias, but the northern tree grows rapidly, is very shapely and covers itself with dense, dark green, handsome foliage.

Other plants now in bloom are the European *Daphne Mezereum* and *Erica carnea*. The former is a small shrub sometimes growing to a height of eighteen inches or two feet, and is ornamental when it is covered with its small flowers, and later in the season when its red fruits are ripe. It may now be seen in good condition on the lower side of Azalea Path. *Erica carnea* is one of the few Heaths which are hardy in this climate and the first of the genus to flower here. The red and white-flowered varieties may be seen in the Shrub Collection and among the Rhododendrons at the base of Hemlock Hill.

The interest in native birds is now so great, and fortunately so rapidly increasing, that it may be interesting to make known some of the resources of winter bird-food which can be found in the Arboretum.

In March a representative of the Department of Agriculture at Washington came to the Arboretum to study the plants found here which might furnish birds with winter food. His examination revealed the fact that fleshy fruits of the sort eaten by birds were still hanging on the branches, and in good condition, of one hundred and ten species of trees and shrubs, and that the fruit of fifteen other species, although dry, was still available as bird-food. These one hundred and twenty-five species belong to thirty genera. Of the species only forty-nine are natives of the United States and only thirty of New England. In the course of a few years, moreover, the number of plants producing winter food for birds will probably be largely increased in the Arboretum by recent introductions.

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Harvard University

No. 53

ARNOLD ARBORETUM

HARVARD UNIVERSITY

BULLETIN

OF

POPULAR INFORMATION



JAMAICA PLAIN, MASS.

MAY 7, 1914

BULLETIN NO. 53.

The most conspicuous plants in flower this week are some of the Cherries of eastern Asia which can be seen in the general Cherry Group on the right-hand side of the road leading from the Forest Hills Gate. The first of these plants to flower this year is *Prunus Sargentii* of which there are several specimens in the collection. This is a large tree in the forests of northern Japan where it sometimes grows to the height of eighty feet and where it is valued as a timber tree. The large, single pink flowers open before the leaves appear and are produced in profusion; these are followed by small fruits which at first when fully grown are bright red but become black when ripe. The leaves are large and of good color, and in the autumn turn to shades of orange and red. As may be seen in the Arboretum, the flowers are of a different color on different individuals, those of some trees being deep rose color and of others pale pink. This is one of the most desirable of the large, deciduous-leaved trees that have been brought into New England from Japan, and it seems destined to become a popular ornament in American parks and gardens. Young plants show a tendency to divide near the ground into several stems and to prevent this and to produce trees with tall straight trunks young plants should be planted close together in the nursery and carefully pruned.

Two other Japanese Cherry trees are in flower, *Prunus subhirtella* and *P. pendula*; these are smaller plants than *P. Sargentii*, and their flowers, which are smaller than those of that tree, are much alike in shape and color. The branches of the former, however, are upright while those of *Prunus pendula* are drooping. On both plants the flowers are produced in the greatest profusion and begin to open before the leaves appear. *Prunus pendula* was taken up many years ago by American nurserymen and is now a favorite ornament in most American collections of trees, but *P. subhirtella*, which is perhaps a more beautiful flowering plant, is still too rarely seen in this country. Two cherries from northern China are also in flower, *Prunus tomentosa* and the single-flowered form of *P. triloba*; the former is a large bush which along some of the Boston parkways has grown six or eight feet tall with a wide spread of branches. This Cherry covers itself with white flowers marked with red at the base of the petals, and followed in June by small slightly hairy fruits of good flavor. In the northwest this little Cherry appears to be hardy beyond the region where the European fruit-cherries can be successfully grown, and it is possible by long cultivation and the selection of promising seedlings it may in time be developed into a valuable food plant. This experiment is certainly worth trying on a large scale. *Prunus triloba* is better known in gardens in its double-flowered form but the single-flowered type is a more beautiful plant, and certainly the flowers on no other tree or shrub are of a purer pink color. First introduced into the Arboretum with *Prunus tomentosa* thirty years ago, it has never grown to a large size and, although perfectly hardy, it is not robust or long-lived.

The Plums, which are next to the Cherries and near the junction of the Forest Hills and Meadow Roads, are fast opening their flowers. *Prunus cerasifera*, the Myrobalan Plum from the Caucasus, and *Prunus triflora*, the only true Plum known in China, are already in flower and the buds of the Plum-tree which grows naturally along the Canadian

border, the so-called Canada Plum, *P. nigra*, is expanding its petals which, pure white at first, turn to rose color as the flowers fade.

Several of the Chinese Magnolias are in flower in the neighborhood of the Administration Building. The most beautiful of them and of all the Magnolias which flower before the leaves appear and are hardy in this climate is the white-flowered Yulan, *Magnolia conspicua*. This tree was found by Wilson on the mountains of western China and is probably widely distributed through the western and central provinces, as it was one of the first Chinese trees introduced into Europe. A number of hybrids of this tree and the shrubby *Magnolia liliflora* (*purpurea*) were produced in France many years ago and are now well known garden plants. These hybrids differ in the size and color of their flowers, which on some plants are rose color and on others white streaked with rose color or pink. The handsomest, perhaps, of these hybrids and certainly the best known, *Magnolia Soulangeana*, is named for the French horticulturist who produced it, Soulange-Bodin. This and the other hybrids flower rather later than *Magnolia conspicua* and therefore more often escape the late frosts which frequently in this climate discolor the petals of these trees.

The northern form of *Magnolia kobus* (var. *borealis*) has flowered much more freely this year than ever before. For many years this tree in the neighborhood of Boston has produced only a few flowers here and there on the ends of its branches, and it is evident that, unlike the Chinese Magnolias which flower when only a few feet high, it requires age before it can show its real value as a flowering tree. The flowers are smaller than those of the Chinese Magnolias and their drooping petals make them less beautiful, perhaps, than the cup-shaped flowers of the Chinese plants, but, judging from the climate of the region where the northern Kobus grows, it may be expected to be hardy in the United States considerably further north than any other Asiatic Magnolia.

The Shadbushes (*Amelanchier*) are fast coming into flower, and as these plants are common in the Arboretum this is a time when the lovers of delicate and beautiful flowers find much pleasure here. Two species grow naturally in the Arboretum, *Amelanchier laevis* and *A. oblongifolia*; the former, which is a tree growing generally on rather dry banks, was long confounded by botanists with the true *Amelanchier canadensis* of Linnaeus. This is also a tree but of more southern and western range than *Amelanchier laevis*, differing from it in the soft pale down which covers the lower surface of the leaves. It is not a native of eastern Massachusetts but is now established in the Arboretum. The second species which grows naturally in the great meadow where there is a large specimen, *Amelanchier oblongifolia*, is shrubby in habit and easily distinguished at this time by the gray color of the unfolding leaves. It is this species which has been largely planted through the Arboretum shrubberies and which in a few days will make a fine show here. Recent investigations have brought to light the existence in the eastern states of a considerable number of species of *Amelanchier* which were formerly unknown or were unrecognized by botanists, and these interesting plants have now been gathered in the bed on the grass path on the left-hand side of the Meadow Road entering from the Jamaica Plain Gate. Some of these plants are already in flower and the flowers of others will continue to open for two or three weeks.

The severity of the winter is shown by its effect on the flower-buds of the Forsythias. On some plants the buds are entirely killed and on

others only a few buds have opened. The plant which has suffered the most is the upright growing variety of *Forsythia suspensa* (var. *Fortunei*). This is the form which is generally planted in the neighborhood of Boston, and the loss of its flowers deprives many Massachusetts gardens of their greatest spring beauty. The buds of *Forsythia suspensa* itself and of *F. viridis* have also suffered, but those of a hybrid between these species (*F. intermedia*) are uninjured or only occasionally hurt. There are several varieties of this hybrid and among them are perhaps the most beautiful of all the Forsythias, and if it proves to be true that their flower buds can resist more cold than those of their parents they will probably soon be better known than they are now. For some reason not easy to explain the Albanian *Forsythia europea* has not before been so full of flowers and they have not before appeared so beautiful. This is a tall shrub with rather rigid erect stems and branches, and has generally been considered here inferior as a flowering plant to the Chinese species, its chief interest having been that it was a European representative of a genus otherwise exclusively Chinese.

Of broad-leaved evergreens which are hardy in this climate three species, all of the Heath Family, are now in flower. The best of them as a garden plant and the handsomest of the small broad-leaved evergreen shrubs which are perfectly hardy in New England, *Andromeda floribunda*, is conspicuous all winter from the clusters of white flower-buds which cover the plant and are now opening. In cultivation it grows to the height of three or four feet and forms a round-topped head sometimes ten feet across. A native of high altitudes in the southern Appalachian Mountains, it is everywhere there a rare and local plant, but long a favorite in English gardens it is now well known in those of the northern states. The largest specimen in the Arboretum can be seen in the border on Hemlock Hill Road opposite the Laurels. In this border, too, can be seen in flower plants of another native shrub with evergreen leaves, the Leather-leaf (*Chamaedaphne calyculata*). This is a low, much-branched shrub with small leaves and white flowers in one-sided leafy racemes. An inhabitant of cold wet bogs, this plant takes kindly to cultivation in dry garden soil. The third evergreen shrub in flower, the Bog Rosemary (*Andromeda glaucophylla*), is an inhabitant of cold northern bogs and swamps, and is also a good garden plant. It can now be seen in good condition in the Shrub Collection where it is conspicuous from the pale under surface of its narrow leaves and clusters of small pink flowers.

An illustrated guide to the Arboretum containing a map showing the position of the different groups of plants has recently been published. It will be found useful to persons unfamiliar with the position of the different groups of plants. Copies of this guide can be obtained at the Administration Building in the Arboretum, from the Secretary of the Massachusetts Horticultural Society, 300 Massachusetts Avenue, Boston, from The Houghton, Mifflin Company, 4 Park Street, Boston, at the Old Corner Bookstore, Bromfield Street, Boston, and at the office of the Harvard Alumni Bulletin, 50 State Street, Boston. Price, 30 cents.

The Arboretum will be grateful for any publicity given these Bulletins.

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The earliest Lilacs are already in flower and next week most of the varieties of the common garden Lilac (*Syringa vulgaris*) will be in bloom. The promise of flowers is excellent, indeed it is several years since the plants have been so full of flower-buds as they are this spring. This year the earliest of the Lilacs is the white-flowering *Syringa affinis* from northern China and its variety with purple or mauve-colored flowers (var. *Giraldii*). These are tall plants of loose unattractive habit, but the leaves are broad and handsome and the flowers, which are produced in rather small clusters, are exceedingly fragrant. This fragrance and the fact that the flowers open so early and are not injured by late frosts make these Lilacs desirable garden plants in this part of the country. The white-flowered form is one of the few shrubs generally cultivated in the gardens of Peking. Another north China species, *Syringa oblata*, is opening its pale purple flowers. This is a plant of much better habit than *Syringa affinis*, and its broad thick leaves, which turn to a dark wine color in the autumn, are handsomer than those of any other Lilac. The flower-buds, however, are often injured by spring frosts and it is not often that the flowers are in good condition. In time this Lilac grows into a broad, round-topped shrub eight or ten feet high and is well worth growing for its foliage; in cultivation it does not produce seeds. A hybrid of *Syringa oblata* and *S. vulgaris* (*S. hyacinthiflora*) is now in bloom. This is an old inhabitant of gardens and is a large, vigorous and shapely plant with good foliage. The flowers are small, semi-double, bluish purple, very fragrant, and are produced in small clusters. As compared with some of the recent forms of the garden Lilac they are not remarkable, but this hybrid should find a place in every collection of Lilacs as its very early flowers prolong the Lilac season. This, thanks to the discoveries of recent years, now lasts here in ordinary seasons from the first of May to the first of July. Attention will be called in these bulletins to the different species, hybrids and varieties as they come into flower.

The flowers of the Crabapples are late this year and are only just showing in the buds the color of their petals. With a few warm days, however, some of these plants will be in full bloom; and it now seems probable that the Lilacs and many of the Crabapples will be in flower at the same time. The old collection of Crabapples is on the left-hand side of the Forest Hills Road, and there is a large collection at the base of Peter's Hill. The plants in this supplementary collection are smaller than those on Forest Hills Road, but it now contains more species and varieties, and the plants of many of them promise to flower this year more freely than those in the old collection. In the neighborhood of the Administration Building there are some large plants of forms or hybrids of the Chinese *Malus floribunda* which are now covered with flower-buds. Among them are plants that carry their fruit through the winter and are particularly valuable as sources of winter bird-food. The Crabapples in the Arboretum form one of its important collections of small trees with conspicuous flowers, and as these plants are suited for the decoration of New England gardens they well repay careful study.

The so-called Japanese Quince (*Pyrus* or *Chaenomeles japonica*) with its bright red flowers appearing before or with the leaves is found in most old-fashioned gardens. In recent years some attention has been paid in Europe to the improvement of this plant, and there are in cultivation forms with flowers of various shades of red and pink, and with white and red and white flowers. There are a large number of these forms in the Shrub Collection but the flower-buds, except those on the lower branches, have been much injured by the winter, and this year it is not possible to get an idea of the beauty of some of these plants. The flower-buds of another of the eastern Asiatic Quinces (*Chaenomeles Maulei*) have not suffered, however, and the plants, which are also in the Shrub Collection, are now in great beauty; they are low, rather wide-spreading, little shrubs and the flowers on different individuals vary from crimson to nearly white. Well suited for planting in the rock-garden, on the margins of shrubberies and on low banks, they appear to be still little known in this country. The Asiatic Quinces, like many related genera in the Rose Family, suffer seriously from the San José scale which, although it can easily be kept in check by spraying, makes them sometimes undesirable garden plants.

The yellow-flowered western American Currants, *Ribes odoratum* and *R. aureum*, are just now two of the most conspicuous plants in the Arboretum. A generation ago the former was one of the common shrubs in American gardens where it was always called the Missouri Currant; it is even sometimes naturalized in the eastern United States. A native of the region from Dakota to Texas, it is perfectly hardy, grows to a large size and flowers freely every year. The other yellow-flowered Currant is a smaller plant with more slender stems and shorter flowers, and is perhaps a more attractive plant than the former. It grows naturally from the headwaters of the Missouri River to the northwest coast and to Arizona, and is still rare in cultivation. There is a variety in the collection from Montana with yellow fruit (var. *chryso-coccum*). Among other species of Currants which are also in flower one of the most interesting is the Rocky Mountain *Ribes cereum* with its handsome foliage and small white flowers. There is a good specimen of this little known plant in the Shrub Collection, where *Ribes tenue* from western China is flowering for the first time in the Arboretum.

In the Gooseberry Collection are now in flower several handsome and interesting species well worth examination by persons interested in shrubs still little known in gardens. Some of the most distinct species now in flower in this group are *Ribes niveum*, with white flowers, from the northwestern United States, *R. missouriense*, with pale yellow flowers, an inhabitant of the region from Missouri to Arkansas, *R. stenocarpum*, with white flowers, from Japan, *R. cynosbati*, and its variety *inermis*, with white flowers, from the northeastern United States, and *R. pinetorum*, with orange-red flowers, from Arizona; in flower this last is perhaps the most beautiful of all the Gooseberries in the Arboretum.

The Korean *Viburnum Carlesii* is uninjured by the winter. This is one of the most beautiful of the exotic Viburnums and is particularly interesting from the fact that the flower-buds are bright orange-red while the inner surface of the corolla is white, and as the flowers open the color of the outer surface gradually fades to pink and then to white.

As the buds do not always expand at the same time there are in the flower-cluster pink buds among the white flowers; the flowers are very fragrant. This plant, although it is still comparatively little known, well deserves a place in every collection of shrubs.

As usual, the earliest Barberry to flower in the Arboretum is *Berberis dictyophylla* which, although it comes from the southern part of China, is perfectly hardy here. The flowers are solitary or occasionally in pairs in the axils of the leaves, rather less than half an inch in diameter and pale primrose yellow in color. The peculiar beauty of the plant, however, is in the leaves, which, although not large, are silvery white on the lower surface and in the autumn turn brilliant scarlet on the upper surface while the lower surface retains its spring and summer color. Plants of this Barberry can be seen in the Shrub Collection and in the supplementary collection of Barberries on Hickory Path near Centre Street.

Prinsepia sinensis is uninjured by the winter and the plant on Hickory Path near Centre Street has flowered more profusely than ever before. This north China shrub is one of the first plants in the Arboretum to unfold its leaves in the spring, and when these are nearly fully grown the clear yellow axillary flowers appear. This beautiful and interesting shrub does not seed at all freely in the Arboretum and is still rare in American collections.

Fothergilla, which is a genus of the Witch Hazel Family, confined to the southeastern United States, has furnished gardens with some beautiful shrubs. All the species bear small white flowers in compact clusters, at the ends of the branches, and handsome leaves resembling those of the Witch Hazels; they are just coming into bloom. *Fothergilla major* and *F. montana* are large, vigorous and very hardy shrubs, while *Fothergilla Gardeni*, which is a small plant and a native of the coast region, is less hardy than the mountain species. These shrubs are in the Shrub Collection and on Azalea Path, and the largest plant of *Fothergilla major* in the Arboretum is in the Witch Hazel Group near the pond at the junction of the Meadow and Bussey Hill Roads.

The form of *Rhododendron praecox* known in gardens as "Little Gem" is usually the first of the evergreen Rhododendrons to flower in the Arboretum. The pale rose-pink flowers are too often injured by late frosts, and this year the flower-buds have been killed by cold, so that this spring the earliest Rhododendron in flower is a dwarf plant received several years ago from Germany under the name of *R. Jacksonii*, a name which does not appear in catalogues. It is evidently one of the forms or hybrids of *R. caucasicum*, although it flowers two or three weeks before any of the other forms of this species in the Arboretum. It is a low compact plant with clusters of large pale pink flowers and has not been at all injured by the winter. There are two specimens in the collection at the base of Hemlock Hill and they are well worth the attention of lovers of dwarf early flowering Rhododendrons.

The Arboretum will be grateful for any publicity given these Bulletins.

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The number of trees and shrubs really valuable here which western Europe has contributed to New England plantations and gardens is not large. Of the trees the Beech, two or three of the Elms, the Birches, the Mountain Ash, the Laburnums, the Norway Maple, the Hawthorn, the Hornbeam, the Poplar, several Willows, the Alder, two or three of the Cherries, the Plum, the Apple and the Pear flourish in this climate. Although some of them will drag out a more or less unhappy existence for several years, the Oaks of western Europe, the Ash, the Sycamore Maple, and all the conifers are not desirable trees for our region. From western Europe, too, we have obtained a few shrubs which are important in New England gardens. The Heather gives summer brightness to New England gardens and hillsides, and the little *Daphne cneorum*, a native of the mountains of central Europe, is now covered with its clusters of fragrant rose-pink flowers. One of the most beautiful of all dwarf shrubs suitable for the decoration of the rock-garden, it is rather capricious as to soil and situation, and does not always flourish in this country as well as it does in the Arboretum.

None of the Barberries which have been brought into our gardens in the last thirty years is more useful than the common European *Berberis vulgaris* which has long been naturalized in eastern Massachusetts and years ago was selected by one of the wise men of Boston as a typical New England plant for the decoration of a monument to be erected to some departed New England worthy. For thirty years, too, much attention has been paid to the introduction and cultivation of the different species of Privet from eastern Asia, but there is not one among them which is as valuable in New England as the common Privet of Europe which must have been cultivated here for two hundred years and is now sparingly naturalized in some of the eastern states. The black and shining berries in large terminal clusters are unsurpassed in beauty by those of any other black-fruited shrub which can be grown here, and as they remain in good condition until into the winter they are valuable on the plants and, when cut, for late autumn and early winter decorations. Among the shrubs of western Europe which are really valuable in New England must be included the Wayfaring-tree, *Viburnum Lantana*. With the exception of the Korean *Viburnum Carlesii* mentioned in a recent bulletin, and of our native northern Hobblebush, *Viburnum alnifolium*, the Wayfaring-tree is the earliest of the Viburnums to flower. It is a tall, compact, round-headed shrub with large, thick, dark green leaves and broad, compact, convex clusters of white flowers. The fruit when fully grown is bright red but finally turns black, fruits of the two colors often appearing at the same time in the same cluster. This shrub is therefore as beautiful in the early autumn as it is in the middle of May; it can be seen in the general Viburnum collection near the junction of the Bussey Hill and Valley Roads, and it has been largely planted in the Boston parks. Near it and just coming into flower are several plants of *Viburnum burejaeticum* from Manchuria, Korea, and northern China. This is a neat shrub with small leaves and small compact clusters of creamy white flowers which are followed by small black fruits. As compared with most of the American Vibur-

nums it has little to recommend it as an ornamental plant; indeed, with a few exceptions, the eastern Asiatic Viburnums are less valuable than the eastern American species, among which are found garden shrubs of the first class. *Viburnum dentatum* and *V. Wrightii* from Japan, with bright red fruits, have no American counterparts, however, and should therefore be cultivated for the autumn garden. These two species will soon be in flower in the Viburnum collection where can now be seen nearly every species and variety which can be grown in this climate.

The large creamy white flowers of *Magnolia Fraseri* are already opening and the leaves are half-grown. This is a small pyramidal tree of rather open habit from the slopes of the Appalachian Mountains from southern Virginia southward, sometimes growing on the headwaters of the Savannah River, where it is most abundant, to the height of thirty or forty feet. In cultivation it begins to flower when not more than half that size, and here in the Arboretum it flowers abundantly every year and is perfectly hardy. This beautiful tree is still too rare in American collections. The much smaller, greenish or yellowish green flowers of the Cucumber-tree, *Magnolia acuminata*, will soon follow those of *M. Fraseri*. The Cucumber-tree, which under favorable conditions sometimes attains the height of eighty or ninety feet, is the largest Magnolia which can be grown in New England and the most northern in its range of all the American species. The flowers of the Cucumber-tree will soon be followed by those of another American species, *Magnolia cordata*. This in the Arboretum is a smaller tree with darker green leaves and small, cup-shaped, canary-yellow flowers. This Magnolia was discovered more than a century ago by the French botanist Michaux somewhere on the headwaters of the Savannah River in Georgia or South Carolina. A little later it was found by Michaux and his son, F. A. Michaux, in the neighborhood of Augusta, Georgia. It was introduced into France by Michaux and the descendants of these trees are now cultivated in the United States and Europe. For many years attempts to rediscover this tree in the regions visited by Michaux have been unsuccessful, and it is interesting therefore to report that the Berckmans of Augusta, Georgia, have recently found *Magnolia cordata* in two stations a few miles south and west of Augusta. The plants are growing in upland Oak and Pine woods, the largest of them being seven or eight feet tall. The plants begin to flower when not more than three feet high, and in April of this year some of these shrubs bore forty or fifty flowers. In cultivation *Magnolia cordata* is always a grafted tree, but it is not probable that the cultivated trees owe their greater size to a stronger stock, and the small size of the plants discovered near Augusta may be due to dry soil and a hot climate, and *Magnolia cordata* as a tree may still be found in some of the moist rich valleys of the small streams flowing down the eastern slopes of the Blue Ridge.

Several handsome American Hawthorns (*Crataegus*) are in full bloom, leading a procession which will last for nearly six weeks. The earliest of these plants to flower here belong to the Molles section of the genus in which some twenty species are now recognized. They are all shapely round-topped trees, some of them growing to a comparatively large size. The flowers are large, in broad many-flowered clusters; the leaves are broad, thin and long-stalked, and on most of the species

begin to unfold as the flowers open. The fruit of these plants is globose or pear-shaped, crimson, scarlet or rarely yellow, and of excellent flavor. The plants of this group are comparatively rare in the east; they do not extend into the southeastern states, and are most abundant in the region from Illinois and Iowa, through Missouri and Arkansas, to eastern Texas. Of this group there are now in flower at the South Street entrance large plants of *C. mollis*, *C. submollis*, and *C. arkansana*. The last is a particularly valuable plant as it retains its brilliant fruit until late in the season and longer than the other plants of this group. Another interesting plant of this group, *C. Arnoldiana*, is valuable because the fruit ripens in August when showy fruits are rare here. This tree was first discovered growing wild in the Arboretum and is still known only from a few stations. It is one of the few species of *Crataegus* which can be easily recognized in winter when its strongly zigzag branches are conspicuous. There are large plants of this tree on the left of the Centre Street entrance, and there are a number of them on the Valley Road in front of the Oak Collection. All of the species of the Mollis Group are American with one exception, *Crataegus peregrina*, which is probably a native of Persia. From the American species it differs in the color of the fruit which is dark purple, unlike that of any American Hawthorn. This plant is in flower in the old *Crataegus* Collection on the bank between the Shrub Collection and the Arborway boundary of the Arboretum, in which there are also plants in flower of *C. arkansana* and *C. Arnoldiana*.

Many plants in the Plum Collection now deserve inspection, notably *Prunus hortulana* and *P. Munsoniana*, both natives of the Missouri-Arkansas-Texas region, the latter the Wild Goose Plum of pomologists. Many of the early flowering Crabapples are still in good condition and the flowers of many others are still to open.

In the general *Rhododendron* Collection at the base of Hemlock Hill *R. carolinianum* is in flower. This is a native of the slopes of the southern Appalachian Mountains. Although this plant was sent to England more than a century ago, it has been entirely lost sight of until a few years ago, having been confused with *R. minus* or *punctatum*, a southern plant of lower altitudes, different habit and foliage and less attractive flowers. *R. carolinianum* flourishes in the shade and in full exposure to the sun. It is a dwarf plant of compact habit; the leaves are dark green, and the comparatively small pink flowers are borne in compact clusters. It is perhaps as hardy in New England as any *Rhododendron*, and it is certainly a plant of great promise either for the decoration of parks and gardens or a possible element in a new race of hybrids. Several plants of *Rhododendron coreanum* are in flower on Azalea Path. This species, which was discovered by Mr. Jack in Korea, is also a plant of much promise; it is one of the species with deciduous or nearly deciduous leaves; the habit is good, and the abundant flowers are of a pleasant rose-purple color. Judging by the experience with it in the Arboretum during the last two or three years it is one of the best of the recent introductions of its class.

When this bulletin reaches its readers many of the plants in the Lilac Group will be in flower, and persons interested in Lilacs should visit the Arboretum during the next week.

The Arboretum will be grateful for any publicity given these Bulletins.

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BULLETIN NO. 56.

In the collection of Hawthorns (*Crataegus*) on the eastern slope of Peter's Hill there are now flowering or soon to flower six hundred and thirty groups, including a few duplicates and a few Old World species. This collection of American Hawthorns is the result of work carried on by the Arboretum during the last fourteen years. During this time most of these plants have been discovered, and many of them have been named and described. They have all been raised from seeds at the Arboretum, and thousands of the young plants have been distributed to cultivators in the United States and Europe. This *Crataegus* investigation has meant many thousand miles of travel by officers of the Arboretum and by its correspondents and friends, and in the last forty years American *Crataegus* seeds under thirty-two hundred different numbers have been sown, seeds of widely distributed species collected in different parts of the country having been sown in order to show possible geographical variation in the seedlings. This investigation has brought to light a large number of beautiful hardy trees and shrubs well suited for the decoration of the parks and gardens of cold temperate regions; and the collection on Peter's Hill, already interesting, should before many years have passed be one of the spectacular features of the Arboretum in spring and autumn. American Hawthorns are distributed from Newfoundland and the northern parts of the Province of Quebec to Florida and Texas, and to the Pacific Coast in the northwest. The largest number of species grow together probably on the streams which flow into Lake Ontario both from the north and south, in southern Missouri and in southern Arkansas. The genus has few species in the Rocky Mountains, and these are small in size and not numerous in individuals, and in the northwest there are only a few widely distributed species. Some of the American Hawthorns are trees which in the rich bottom-lands of the Mississippi valley attain a height of thirty or forty, or even fifty, feet with tall straight trunks and widespreading branches, many are shrubby in habit, and there is one group (*Intricatae*) in which nearly all the species are small shrubs rarely more than three or four feet high. These small shrubs bear large and showy flowers followed, in the case of many of the species, by large, bright colored and abundant fruits. They are valuable and interesting plants therefore for small gardens. In spite of all which has been done at the Arboretum to discover and introduce these plants, the investigation must be considered as not more than fairly begun, for there are still thousands of square miles of territory in North America where Hawthorns grow which have not been explored with reference to these plants.

Next to the Lilacs the most valuable shrubs, perhaps, for northern gardens now in flower are the Bush Honeysuckles, of which there is a large collection in the Arboretum. Many of the large-growing kinds, especially forms of the old-fashioned Tartarian Honeysuckle, are conspicuous objects when covered with flowers, and they have the advantage over the Lilacs of producing in summer and early autumn abundant crops of brilliant fruits. These Honeysuckles and the Lilacs are the most satisfactory shrubs which can be grown in northern regions of extreme cold. There are many hybrid Honeysuckles. One of the handsomest of the hybrids, *Lonicera notha*, with pale pink flowers, is believed to be the result of a cross of *L. tatarica* with *L. Ruprechtiana* of northeastern Asia. There are two large specimens of this plant on the right-hand side of the Bussey Hill Road and opposite the

Lilac Group. There is here also a large plant of *Lonicera bella*, with pale yellow flowers, the result of a cross between *L. tatarica* and *L. Morrowii*; and here, too, are plants of *L. chrysantha* from north-eastern Asia now in full bloom, and of *L. orientalis* from southeastern Europe which will not open its flowers for several days.

Other interesting Bush Honeysuckles now to be seen in the Shrub Collection are *Lonicera xylostoides*, with white flowers, a hybrid between the Tartarian Honeysuckle and *L. Xylosteum*, *L. muendeniensis*, with pale yellow flowers, a hybrid of the Tartarian Honeysuckle with *L. Morrowii* from northeastern Asia, *L. muscaviensis* with pale yellow flowers, a hybrid between *L. Morrowii* and *L. Ruprechtiana*, *L. segreziensis* with white flowers, a hybrid between *L. quinquelocularis* and *L. Xylosteum*, *L. multiflora* with white flowers, a hybrid between *L. micrantha* and *L. Morrowii*, and two beautiful plants with pale bluish foliage and small rose-colored flowers, *L. Korolkowii floribunda*, and a hybrid of *L. Korolkowii* with *L. tatarica* which appeared in the Arboretum a few years ago and known as *L. amoena Arnoldiana*. These are only a very few of the plants now in bloom in this collection, which is one of the most important in the Arboretum.

An examination of the plants of the wild Lilac, *Syringa vulgaris*, is interesting as showing the great improvements which have been made in garden Lilacs since the introduction of this plant into western Europe. The original Lilac, *S. vulgaris*, was found only a few years ago to be a native of the mountains of Bulgaria, and there is now a group of these plants raised from seeds collected from the wild plants in Bulgaria now flowering at the foot of the bank on the left-hand side of the path which passes up through the Lilac Group. These plants are labeled "*Syringa vulgaris*, mountains of Bulgaria."

The two northern pink-flowered species of Azalea, or Wild Honeysuckle, as these plants are often called, *Rhododendron canescens* and *R. nudiflorum*, are now in flower. The former is a northern and the latter a more southern plant, and is especially common in the Gulf States from Florida to eastern Texas. The flowers of these plants open before or with the unfolding leaves and in early spring fill the woods with their fragrance. Both species can now be seen on Azalea Path, and there is a good mass of *Azalea canescens* on the right hand side of the Meadow Road in front of the Linden Group.

The flowers of the Highbush Blueberry, *Vaccinium corymbosum*, have never been more abundant or lasted longer in good condition in the Arboretum than this year, and it is desirable to call attention again to this wonderful plant which is beautiful in its flowers, its abundant edible fruits, and the splendid scarlet of its autumn leaves. The Highbush Blueberry, which grows naturally along the borders of swamps and other low places, where it occasionally reaches a height of from twelve to eighteen feet, is easily cultivated in good garden soil. On the plants in the Arboretum, where they have been largely planted, the flowers differ in size and in the time of opening. The individuals vary, too, in the size and quality of their fruit, but all the forms seem equally valuable as garden plants. For its fruit, which is the best of all Blueberry fruit, and for the beauty of its flowers and autumn leaves, this shrub cannot be too often planted. There are several plants on each side of Azalea Path near its entrance from the Bussey Hill Road; and the Highbush Blueberry can also now be seen in many of the Roadside plantations, especially in the piece of swampy ground on the right-hand side of the Meadow Road in the rear of the Horsechestnut Group.

Aronia, a genus of the Rose Family, confined to eastern North America, sometimes considered a section of the genus *Pyrus*, contains val-

uable plants for the garden shrubbery. There are three species, all widely distributed in the eastern part of the country, *Aronia melanocarpa*, *A. atropurpurea* and *A. arbutifolia*. They all have small white flowers with rose-colored anthers borne in erect compound clusters, showy fruits and handsome foliage. What is believed to be the type of *A. melanocarpa* is a shrub twelve or eighteen inches high, with stems spreading into a broad mat. There is a form of this species (var. *elata*), however, which is much more common and grows into a shrub from six to ten feet tall, and another form (var. *grandifolia*) with broader leaves; this is also a tall shrub. The fruit of this species is black and lustrous, and drooping on long stems hangs on the plant during the winter. *Aronia atropurpurea* is also a tall shrub, in general habit and foliage like the var. *elata*. The fruit, however, is dark, vinous red and ripens and falls earlier. The leaves of these two species turn orange and red in the autumn before falling. *Aronia arbutifolia* is a tall, slender shrub of irregular habit, with flowers which open later than those of the other species, smaller leaves, covered with white down on the lower surface, and erect clusters of small, bright scarlet fruits which remain on the plants without change of color well into the winter. The brilliant fruit and the bright scarlet of the autumn leaves makes this late in the season one of the most beautiful of all our native shrubs. Less common in the north, perhaps, than the other species, *Aronia arbutifolia* is a very common plant in all the southern states where it is very generally distributed, often growing in great abundance on the margins of small depressions in the Pine woods which in spring are filled with water. All the forms of *Aronia* are easily cultivated and are now in flower in the Shrub Collection. They have also been largely planted in the shrubberies along the Arboretum roads.

Several of the *Viburnums*, notably *Viburnum prunifolium*, a small tree from the middle states, *V. Wrightii* from Japan, chiefly valuable for its scarlet fruits, *V. Sieboldii* from Japan, one of the largest of the Asiatic species with handsome foliage, large convex clusters of creamy white flowers, and large lustrous fruits which, at first scarlet, become black when fully grown. A more beautiful plant and the handsomest of the Asiatic species, *V. tomentosum* is also in flower. It is a large flat-topped shrub with wide-spreading branches, on the upper side of which the flower clusters are set; these are broad and flat, and they are surrounded by a ring of large, pure white sterile flowers which are the conspicuous part of the inflorescence. There is an interesting narrow-leaved form of this plant, discovered in Japan by Professor Sargent, also in flower in the Collection. There are also two Snowball forms of this species developed in Japanese gardens and much cultivated here and in Europe under the name of *Viburnum plicatum*. The correct name of the more common of these two plants is *Viburnum tomentosum*, var. *dilatatum*. This is the Japanese Snowball cultivated in this country and it will not be in its best condition for another week. The other form, *V. tomentosum*, var. *dilatatum*, f. *rotundifolium*, which is a dwarfer plant, is already in flower. They can be seen in the general *Viburnum* Collection on the Bussey Hill Road just before it turns into the Valley Road near the Centre Street Gate.

The Arboretum will be grateful for any publicity given these Bulletins.

RECEIVED

Gray Herbarium
Harvard University

No. 57

ARNOLD ARBORETUM

HARVARD UNIVERSITY

BULLETIN

OF

POPULAR INFORMATION



JAMAICA PLAIN, MASS

JUNE 5, 1914

BULLETIN NO. 57.

When this bulletin reaches its readers a large number of Rhododendrons at the base of Hemlock Hill will be in flower. The flowers of a few have faded and those of others will continue to open during several days. The number of species of Rhododendrons with evergreen leaves which can be successfully cultivated in this climate is not large. The four species of eastern North America, *Rhododendron maximum*, *R. Catawbiense*, *R. carolinianum* and *R. minus* are all perfectly hardy, as are *R. Smirnowii* and *R. caucasicum* from the Caucasus, *R. brachycarpum* from Japan and *R. micranthum* from China. The flower-buds of the last, however, have been destroyed by the cold of the past winter. The two European species, *R. ferrugineum* and *R. hirsutum*, are in the collection but they are not very satisfactory plants for this climate, and unless exceptionally favorable positions can be found for them they are not long-lived here. In recent years *R. maximum* has been largely planted in this part of the country, but the common Rhododendron of American gardens belongs to a race of hybrids which originated in England many years ago and are known as Catawbiense hybrids because they have been produced by crossing *R. Catawbiense* of the high summits of the southern Appalachian Mountains with *R. ponticum* of the Caucasus, and with *R. arboreum* and other Himalayan species. These hybrids are valuable in this country in proportion to the influence on them of *R. Catawbiense*, and it is found that varieties with broad leaves like those of the American plant are always hardier than the narrow-leaved varieties which show a greater influence of *R. ponticum* and the Indian species. The number of these hybrids, however, which are really hardy in this climate is not large; among them Atrosanguineum (very early), Charles Dickens and H. W. Sargent (late) of red-flowered varieties are good plants; among the pink-flowered varieties none have proved so satisfactory as Mrs. Charles Sargent and Henrietta Sargent, similar in general appearance, but the latter with smaller and more compact flower-clusters and flowers of not quite such a perfect pink. Among the varieties with rose-colored flowers, Roseum elegans and Lady Armstrong are hardy and satisfactory; and among the varieties with dark purple flowers Purpureum grandiflorum, Purpureum elegans and King of the Purples are all hardy. Of the varieties with light purple flowers Everestianum is the best and one of the hardiest and most satisfactory of all these hybrids. Among the white-flowered varieties Catawbiense album (very early), Album elegans and Album grandiflorum can be safely used. Most of the hybrid Rhododendrons in American gardens are of English origin, but a few years ago the Arboretum obtained in Germany a number of these hybrids raised in that country. These have proved very hardy and some of them promise to be valuable additions to the Rhododendrons which can be successfully cultivated here. The most distinct, perhaps, are Viola, with white flowers, Albert, with pale pink flowers, and Bismarck, with white flowers with small brown dots on the inner face of the corolla. The last has flowered profusely now every season for the last three years; the foliage and habit are good, and as it flowers early this variety is particularly valuable, for there are not many early white-flowered Catawbiense hybrids. Among the hybrid Rhododendrons which

have been raised between *R. catawbiense* and *R. maximum* the best known is *Delicatissimum*. This blooms later than the *Catawbiense* hybrids; it is a large plant, of good habit, with long lustrous leaves and pale pink and white flowers, and one of the best *Rhododendrons* which can be grown in this climate.

The experience of another year confirms the good opinion which the Caucasian *Rhododendron Smirnowii* has made for itself here. It is a large plant with pale green leaves covered below with a thick mat of nearly white wool and large clusters of bright pink flowers. It grows best in partial shade as the hot sun of our summer causes the leaves to curl. A number of hybrids have been obtained in Europe by crossing this species with some of the *Catawbiense* hybrids. Some of these hybrids are established in the Arboretum and have flowered for several years, but the cold of the past winter has destroyed their flower-buds. *Rhododendron caucasicum* and its hybrids or varieties should be more often found in our gardens, in which the form of this species known as *Boule de Neige* is the only one usually seen. Like the other forms of *R. caucasicum* it is a small compact plant which covers itself with clusters of large white flowers which open earlier than those of most of the *Catawbiense* hybrids. This earliness, its good habit, and its handsome pure white flowers make this a desirable garden plant in this climate. Another plant of this race with pale yellow flowers, known as *R. coriaceum*, is now in flower in the collection and is also a hardy and desirable plant. A smaller plant of this race, *Mont Blanc*, is interesting as the flowers, which are bright pink when they open, become at the end of a day or two pure white. On some of the dwarf forms of *R. caucasicum* the flower-buds have been injured this year for the first time, but in spite of this these plants can be recommended for New England gardens.

Attention is called to the red-flowered *Aesculus Briotii*, an improved form of the so-called Red-flowered Horsechestnut, *Aesculus carnea*, a supposed hybrid between the European Horsechestnut and *A. Pavia* of the southern United States. *Aesculus Briotii* is the handsomest of the red-flowered arborescent Horsechestnuts and should find a place in all collections of trees with showy flowers. A beautiful, shrubby, red-flowered Horsechestnut, or Buckeye as these plants are called in the United States, is in flower in the Horsechestnut Group on the right-hand side of the Meadow Road. This plant is now known to grow naturally from Georgia and Alabama to Texas and Arkansas and to be the only red-flowered species in the region west of the Mississippi River. First discovered in Arkansas many years ago by the botanist Nuttall, it was named by Rafinesque *Aesculus mollis*; later another botanist called it *Aesculus austrina*. In the Arboretum it is called *A. discolor* var. *mollis* because it is believed to be only a variety of another southern species, *A. discolor*, with which it grows in Georgia and Alabama. But whatever name may be imposed on it this Buckeye is one of the handsomest flowering shrubs in the United States, and it is fortunate that it has proved perfectly hardy here. Flowering with it is another southern shrubby species with red and yellow flowers, in short, very compact clusters, *A. georgiana*, which is a garden plant of much promise. Three other dwarf Buckeyes are also in flower, *Aesculus humilis*, two different plants under the name of *A. rosea nana*, and *A. Michauxii*. They are small plants with yellow and red flowers occasionally cultivated in

European gardens and probably hybrids of American species, for none of these plants have yet been found growing wild and their parentage is not clear, but whatever their origin may have been they are attractive and useful garden plants.

The Arboretum owes much of its early summer beauty to the *Viburnums*, and none of these plants are more conspicuous just now than the native Nannyberry, *Viburnum Lentago*, which has been largely used here. This large shrub, or small tree, with its large lustrous leaves and broad convex clusters of white flowers tinged with yellow, and its drooping clusters of black fruit, is one of the handsomest of the whole genus, and if it grew on the borders of Tibet instead of along New England roadsides it would be better known and more highly considered in New England gardens than it is at present.

The three species of the *Opulus Viburnums* are now in flower on the right-hand side of the Bussey Hill Road and in the *Viburnum* Collection, and their comparative value as flowering plants can be seen. The European *Viburnum Opulus* has smaller flower-clusters than the others, but it is a larger plant and holds its leaves later in the autumn without change of color; the beauty of the bright red fruits is thus heightened by contrast with the leaves. The American species, *Viburnum americanum*, is a plant of more open habit. The leaves turn orange color in the autumn and fall early, leaving the orange-red fruits on the naked branches. The Asiatic species, *V. Sargentii*, has the handsomest flowers of the three species as the neutral ray-flowers are much larger than those of the other species. The habit of this plant is good, but the fruit is small and inconspicuous. There are forms of the European *Viburnum Opulus* with yellow fruit (var. *xanthocarpum*), and there is a dwarf very compact form which rarely flowers; the Snowball of old-fashioned gardens is a form of the European plant in which all the flowers are sterile.

Rosa Hugonis has been in flower in the Shrub Collection for the first time in the Arboretum. It is a native of western China, with clear yellow single flowers and neat pale foliage. There are not many yellow-flowered Roses hardy in New England, and *R. Hugonis* promises to be a valuable addition to the number.

Other plants now in flower or soon to flower of special interest are *Berberis Poirerii* and *B. sinensis*, *Rosa spinosissima altaica* and *R. spinosissima fulgens*, *Potentilla fruticosa ochroleuca* and *P. Vietchii*, *Lonicera Maacki* and its variety *podocarpa* and several *Diervillas*, all in the Shrub Collection. Worthy of notice, too, are several of the new Chinese *Cotoneasters*, to be seen in the Bussey Hill collection of *Caine*-ese plants and in the Shrub Collection.

In the Lilac Group the Korean *Syringa velutina* is flowering for the first time in the Arboretum. The small rose pink flowers of this shrub are borne in long, narrow, irregular clusters at the ends of the slender arching branches.

The Arboretum will be grateful for any publicity given these Bulletins.

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Harvard University

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ARNOLD ARBORETUM

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JAMAICA PLAIN, MASS.

JUNE 11, 1914

BULLETIN NO. 58.

Six of the species of Rhododendrons with deciduous leaves (Azalea) of eastern North America are well established in the Arboretum, and no group of plants perfectly suited to our climate surpasses them in beauty. The first of these plants to bloom, *R. Vaseyi*, opens its small pink flowers early in May before the leaves appear. This Azalea is an inhabitant of a few of the high valleys of the Blue Ridge in North and South Carolina and had been entirely overlooked until some thirty years ago. It is a plant of loose irregular habit, sometimes growing to the height of fifteen or eighteen feet, although in cultivation it begins to flower when less than a foot high. It is perfectly hardy, and the pure perfect pink of its flowers is hardly equalled by that of the flowers of any other plant. There is a form of this Azalea with white flowers. It grows best in rather moist soil in the neighborhood of water, and single individuals generally look better than the large masses sometimes seen in public parks.

Not much later two other pink-flowered species are in bloom, *R. canescens* and *R. nudiflorum*; the former is a more northern and the latter a more southern species, although the two often grow in the same locality. Both produce pale rose or pink flowers of various shades which appear before the leaves or just as they begin to unfold, and their general appearance is very similar. These plants grow singly or in great masses on treeless hillsides or in open woods. *R. canescens* is very abundant in some parts of Worcester County, Massachusetts, and the bundles of branches covered with pink flowers which excursionists on the northern railroads bring into Boston in May are of this species. These two Azaleas take kindly to cultivation and thrive in good soil in either shady or open situations.

The next of these Azaleas to flower, the yellow Azalea of the Appalachian Mountain slopes, *R. calendulaceum*, is now in bloom. The beauty of the brilliant flowers is heightened by contrast with the dark green leaves which are well grown before the flowers open; these vary from bright yellow to orange or shades of red and are not surpassed in brilliancy by those of any other Azalea now in cultivation. *R. calendulaceum* is a slow-growing but long-lived plant, and in time will reach a height of eight or ten feet. There is a large mass of these plants showing the variations in the color of the flowers on the lower side of Azalea Path, and a number of individuals are scattered in border-plantations along the different roads. The flowers of the yellow Azalea will soon be followed by those of another inhabitant of the glades of the Appalachian Mountains from Pennsylvania to Georgia, *R. arborescens*. This is a tall shrub with large, pure white, very fragrant flowers, the beauty of which is increased by the bright scarlet color of the long filaments of the stamens and of the style. The pale leaves of this plant are fully grown before the flowers open. There are many small plants of this species on the lower side of Azalea Path, and there is a mass of it on the Valley Road in front of the Hickories. The last of these Azaleas to bloom (*R. viscosum*) will not be in flower for several weeks. It is a common inhabitant of low wet ground in the eastern part of the country, and is popularly known as the Swamp Honeysuckle. The small white flowers continue to open during many weeks and their fragrance, which is greater than that of the other Azaleas, makes known their presence especially in the evening, from a long distance.

Seedlings of two other American species have been raised at the Arboretum, but it is too soon to judge of their value as garden plants. They are *R. austrinum*, with slender pale yellow flowers appearing before the leaves, a native of the valley of the Apalachicola River in western Florida, and *R. candidum* from southern Georgia, with white or pale pink flowers appearing after the leaves. There is another Azalea to introduce into the gardens. This a native of central Georgia where, in some localities, it is very abundant in open woods. Discovered by Michaux, the French botanist, more than a century ago and confounded by him and all later authors with *R. calendulaceum*, it has been called the variety *flammeum* of that species. From *R. calendulaceum*, however, this plant, which should be called *R. flammeum*, differs in its winter-buds, in the size and shape of the flowers and in the fact that the flowers open before the leaves. The flowers on different plants vary from yellow to deep orange and to scarlet; and the flowers of no other Azalea compare in brilliancy with some of the deep-colored forms of this Georgia plant, which it is reasonable to hope may prove hardy here as several plants from the same general region are well established in the Arboretum. The beautiful, white-flowered Azalea (*R. occidentale*) from the borders of streams on the western slopes of the Cascade and Sierra Nevada Mountains of the west has not yet proved hardy here probably because just the right place has not been found for it.

These native Azaleas are handsomer, hardier, and in every way more satisfactory than the so-called Ghent Azaleas which are hybrids of some of our species with the Caucasian yellow-flowered Azalea (*R. flavum* or *Azalea pontica*). This plant is not hardy here, and its influence on the Ghent hybrids has been unfortunate so far as this country is concerned. Many of these hybrids are beautiful flowering plants; some are quite hardy but most of them show evidence of a poor constitution; they grow slowly and suffer in severe winters, and none of them have the vigor of their American parents. These Ghent hybrids are raised by grafting in great quantities in European nurseries and many of them come to this country. It is impossible, however, to obtain the native plants in large quantities. Occasionally plants collected from the woods are offered for sale, but these collected plants are always less desirable than nursery-raised seedlings which are rarely to be found; and the American nurseryman who will take up the raising of seedling American Azaleas on a large scale will confer a benefit on American gardens.

Magnolia glauca of the Atlantic coast region from Massachusetts to Florida is in bloom. No small tree is a more delightful inhabitant of the garden, where it is an object of beauty throughout the year with its bright green branches in winter and its beautiful leaves which are dark green and very lustrous above and silvery white below, and which remain on the branches at the north without change of color until the beginning of winter and in the south till early spring. The small, creamy white, cup-shaped flowers continue to open during many weeks, and especially in the evening fill the air with their delicate pungent odor; they are followed by the cone-shaped fruits which are common to all Magnolias and are showy when the scarlet seeds hang from them on slender threads. Every one with a garden who makes the acquaintance of this plant wants to grow it; it is easily raised from seed, and at the end of three or four years seedling plants are of saleable size. In spite of the demand for it, which would increase if plants could be had, it is almost impossible to find this Magnolia in American nurseries. *Magnolia Thompsoniana* is also in good bloom. This is a hybrid raised in

England many years ago between *M. glauca* and the American Umbrella-tree, *M. tripetala*. It has leaves like the leaves of *M. glauca*, which it also resembles in the perfume of the cup-shaped pure white flowers intermediate in size between those of its parents. Unlike many hybrids which are usually hardier and more vigorous than their parents, *M. Thompsoniana* is less hardy than either *M. glauca* or *M. tripetala*, and sometimes has been killed to the ground in severe winters. The latest of the Magnolias, *M. macrophylla*, now covered with buds, is still to flower. This handsome tree is interesting for it has larger leaves and larger flowers than any other plant of the northern hemisphere beyond the tropics. A native of the south from North Carolina to Louisiana, it is perfectly hardy here; it is best planted, however, in sheltered positions as the leaves are easily torn and disfigured by the wind. These Magnolias are on the right-hand side of the Jamaica Plain entrance east of the Administration Building.

On the Administration Building a plant of the Japanese climbing Hydrangea (*H. petiolaris*) is now in flower. In the country this plant is usually seen climbing up the trunks and spreading over the branches of trees, but it has been found capable of attaching its stems firmly to brick-work and therefore to be useful in covering walls and buildings. The bright green foliage makes a handsome contrast with the broad heads of flowers which are surrounded by a row of neutral ray flowers of medium size. Two shrubby Hydrangeas will soon be in flower in the Shrub Collection, *H. Bretschneideri* from northern China and its variety *setchuenensis* from western China. The former is an old inhabitant of the Arboretum and is a tall, free-flowering shrub well worth a place in all collections. The variety which is less well known appears to be perfectly hardy and equally free-flowering.

Some of the earliest of the large collection of Mock Oranges (*Philadelphus*) are already in bloom. The earliest this year is *Philadelphus hirsutus* of the southern Appalachian region, a tall shrub of rather open habit, with small flowers and of no great ornamental value. The Korean form of *P. Schrenkii* (var. *Jackii*), a plant of columnar habit and the European *P. coronarius*, the Mock Orange of all old-fashioned gardens, are also in bloom. Of the latter there are in the collection a dwarf form which does not often bloom, a form with yellow leaves and one with very narrow leaves (var. *salicifolia*), a distinct and interesting plant.

Other interesting plants now in flower in the Shrub Collection are the Chinese *Cotoneaster hupehensis*, with white flowers which are showier than those of the other species of the genus, and make the plant look like a *Spiraea*, *Indigofera Kirilowii* from Korea, with pink flowers, *Genista germanica*, and *Spiraea bracteata* from Japan, a large shrub with long arching branches and one of the handsomest of the still little known *Spiraeas*, *Lonicera Ledebourii* is still in good condition, and *L. Kirilowii amoena* is only just now dropping its lovely pink flowers.

This bulletin will reach its Massachusetts readers at a time when a visit to the Arboretum will repay all lovers of flowers for the Laurels (*Kalmias*) will be in bloom at the base of Hemlock Hill.

The Arboretum will be grateful for any publicity given these Bulletins.

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JUNE 18, 1914

BULLETIN NO. 59.

The so-called Tree-Lilacs are beginning to flower and promise to be exceptionally fine this year. There are three of these Lilacs, all natives of northeastern Asia, and they differ from the true Lilacs in the short tube of the corolla of the flower from which the stamens protrude, and for this reason were once placed in a different genus, Ligustrina. The three species produce white, bad-smelling flowers with an odor like those of the Privets, and their leaves fall early in the autumn without change of color, in this differing also from the true Lilacs which hold their leaves until late in the season. The first of the Tree-Lilacs to flower, *Syringa amurensis*, is a native of eastern Siberia; it is a small tree or tree-like shrub with flat, spreading or slightly drooping clusters of ivory white flowers which make a fine contrast with the dark green leaves. The second species to flower is a native of northern China, *Syringa pekinensis*. This in cultivation is a shrub rather than a tree, although it sometimes reaches in this country the height and spread of branches of thirty feet. The stout stems are more or less pendent at the ends and are covered with lustrous reddish brown bark which readily separates into thin layers, like that of some of the Birch trees. The long, narrow, pointed leaves hang gracefully, and the half-drooping flower-clusters, which are flat and unsymmetrical, are smaller than those of the other plants of this group. *Syringa japonica*, a native of the forests of northern Japan, is the last of the Tree-Lilacs to flower. This is really a tree, often from thirty to forty feet high, with a tall stout trunk covered with lustrous brown bark, like that of a Cherry-tree, and a round-topped head. The flowers are produced in large, erect, symmetrical clusters which stand up well above the dark foliage and make this Lilac one of the most beautiful of the flowering trees which can be grown in this climate. The Tree-Lilacs are on the bank near the lower end of the Lilac Group, on the left-hand side of the path which passes up through this group. They are best seen, however, from the path which follows the top of the bank on which the Lilacs are planted. There is also a large plant of *Syringa japonica* among the Crabapples on the left-hand side of the Forest Hills Road, the site of the first Arboretum nurseries. This is one of the original plants raised from seeds sent from Japan to the Arboretum in 1876 by Colonel William S. Clarke, first President of the Massachusetts Agricultural College and of the Agricultural College at Sapporo, by whom this plant through the Arboretum was introduced into gardens. *Syringa amurensis* still remains comparatively rare in gardens; *S. pekinensis* has been occasionally planted in those of eastern Massachusetts, but *S. japonica* is now a common plant in the eastern states. All three species grow poorly in western Europe, and the size of the plants and the masses of flowers which they produce here always surprise European visitors to the Arboretum.

On the walk at the top of the Lilac bank one of the newer Lilacs, *Syringa Sweginzowii*, is in flower. This plant, which is probably a native of northern China or of Korea, is flowering in the Arboretum for the third year and appears to be perfectly hardy. It flowers very freely and the flowers, which are borne in narrow clusters, are slender with a long tube and are white tinged with rose color, and slightly fragrant. It is one of the latest, if not the latest, of the true Lilacs to flower here and promises to be a valuable garden plant in New England.

In the group of plants belonging to the *Elaeagnus* or *Oleaster* Family, on the left-hand side of the Bussey Hill Road above the Lilacs, *Elaeagnus angustifolia* is a conspicuous object. This small tree is a native of southern and southeastern Europe, Asia Minor, and southwestern Asia. It is now in flower but the small, pale yellow, fragrant, axillary flowers are almost hidden by the leaves, and it is in the leaves that the greatest beauty of this tree is found; these are long and narrow like those of some Willows and they are silvery white, retaining this color during the season. No other tree or shrub which is hardy in New England has foliage of such silvery whiteness, and where it is desirable to produce in this climate in a plantation a striking effect by the use of a tree with white foliage *Elaeagnus angustifolia* is the best plant for the purpose. It has sometimes been called the Wild Olive-tree for the reddish brown fruits which ripen in summer resemble in shape small olives.

The native Cornels (*Cornus*) have been largely used in the Arboretum, and the late-flowering species are beautiful here from the middle to the end of June. One of these plants, *Cornus rugosa*, sometimes called *C. circinata*, is a common native shrub and one of the handsomest of the whole genus. It has green branchlets, broad, rounded pale green leaves, paler and hairy on their lower surface, and conspicuous clusters of creamy white flowers which are followed by beautiful light blue fruits. Like a few other Dogwoods, it is difficult to transplant, but once established it soon spreads into large masses. There are several individuals in the Cornel Group at the junction of the Meadow and Bussey Hill Roads, and large shapely plants can be seen on the bank just above the group of Sassafras trees on the right-hand side of the Bussey Hill Road and below the Benzoin Group. Among the Hickories on the right-hand side of the Meadow Road there are also large groups of this plant. A smaller plant and less showy, perhaps, *Cornus racemosa*, sometimes called *C. paniculata* or *C. candidissima*, is just beginning to open its flowers. This is a common inhabitant of roadsides and wood-borders in this part of the country, and is a round-headed shrub with slender erect stems and creamy white flowers produced in compound oblong clusters. The plant is as beautiful in October as it is in June for the flowers are followed by translucent white berries borne on bright red stalks, making this one of the most interesting of the shrubs which ripen their fruit in mid-autumn. The Silky Cornel (*C. Amomum*) is the last of the native species to flower. This is a large, widespreading shrub and requires abundant space in which to show its beauty of habit. For this reason it should be planted as an isolated specimen or on the borders of ponds or streams, a purpose for which it is admirably adapted. Its purple stems are attractive in winter and the bright blue fruits which ripen in the autumn add materially to the attractiveness of this shrub.

The Arboretum owes much of its early summer beauty to four shrubby species of native *Viburnums* which have been planted in large numbers through its border plantations and which can be compared in the *Viburnum* Group on the right-hand side of the Bussey Hill Road near its junction with the Valley Road. The first of these shrubs to flower, *Viburnum dentatum*, is already beginning to shed its flowers which during the summer will be followed by clusters of bright blue fruits. This is a common roadside and meadow shrub in the northeastern part of the country and, like the other American species, improves by cultivation, producing better foliage and handsomer flowers and fruits. The second species of this group, *Viburnum cassinoides*, is now in

flower. This is a native of swamps in the northeastern part of the country where it sometimes grows twenty feet high. In cultivation it has proved one of the handsomest of all the *Viburnums* introduced into the Arboretum where it forms a round-headed compact shrub. The leaves, which are thick and lustrous vary greatly in size and shape. The flowers are slightly tinged with yellow and are borne in large slightly convex clusters; the fruit is larger than that of the blue-fruited shrubby species, and at first yellow-green later becomes bright pink and finally blue-black and is covered with a handsome pale bloom; fruits of the three colors are found together in the same cluster. The third of these species, *Viburnum venosum*, will not be in flower for another week. This resembles *V. dentatum* in general appearance and in the blue fruit, but the young branches and the under surface of the leaves are covered with a thick coat of stellate hairs. This *Viburnum* is found growing naturally only in the neighborhood of the coast from Cape Cod and Nantucket to New Jersey. A larger plant with large lustrous leaves and more showy flowers, and larger later-ripening blue fruit, *Viburnum Canbyi*, will not flower for two or three weeks. This plant appears to be confined to eastern Pennsylvania and northern Delaware, where it is by no means common; in cultivation it grows to a large size.

One of the attractive plants now in flower in the Shrub Collection is *Halimodendron argenteum*, the so-called Salt-tree because it inhabits the saline steppes near the river Irtysh in Siberia. The pale rose-colored fragrant pea-shaped flowers, which are produced in great profusion, are borne in small clusters, and their delicate beauty is heightened by the color of the leaves which are covered with a silky down. This plant remains in flower during several weeks in the Arboretum and produces abundant crops of pods but the seeds apparently are rarely fertile.

The large and widely distributed genus *Indigofera* of the Pea Family has given a few beautiful small shrubs to our gardens. Two of these can now be seen in good condition on Hickory Path near Centre Street. The showier of the two, *I. Kirilowii*, is a low shrub spreading by underground stems, with ample leaves and comparatively large bright pink flowers in long racemes. It is a native of Korea. With it is a plant of *Indigofera amblyantha*, one of Wilson's discoveries in western China and a slender little shrub with erect stems and axillary racemes of small rose-colored flowers which are produced continuously through the summer. Among Wilson's discoveries there is not a more delightful small shrub than this. On the left-hand side of Azalea Path, near its entrance from the Bussey Hill Road are two other species of *Indigofera*, the white-flowered *I. decora* from China, and the purple-flowered *I. Gerardiana* from the Himalayas. The stems of these two plants are killed back to the ground every winter but new stems spring up in the spring, and as the flowers are produced on the new growth the killing of the old stems does not interfere with the flowering of these plants.

The Arboretum will be grateful for any publicity given these Bulletins.

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ARNOLD ARBORETUM

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OF

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JAMAICA PLAIN, MASS.

JUNE 25, 1914

BULLETIN NO. 60.

Most of the conifers still retain the delicate colors of the foliage of their young branchlets, and this is a good time for the lover and planter of these trees to examine the Arboretum pinetum.

Eastern North America is not a good region for these trees. Many of them cannot long bear our hot dry summers, cold winters, and the cold nights, the hot sun and the winds of a New England March. For ornamental planting here better and more permanent results are obtained by the use of deciduous leaved trees and shrubs than by the general planting of conifers and broad-leaved evergreens. Two of the handsomest of coniferous trees, however, are native to this part of the country, the White Pine (*Pinus strobus*) and the Hemlock (*Tsuga canadensis*), and where these two trees thrive the lover of evergreen trees need not lack material for his plantations. It can be said generally that the conifers of northeastern North America, the Rocky Mountains, northern, central and southeastern Europe, Siberia, northern China and northern Japan, are hardy in this climate, and that those of the southern United States, Mexico, Central America and the countries south of the equator, the Himalayas and southeastern Asia are not hardy; that only a few of the species of western North America can be safely planted in this climate, and that so far as it is possible to judge by our experience here many of the Pines, Spruces, Firs and Larches which cover the mountain slopes of the Chinese-Tibetan frontier promise to be hardy in New England. In the Arboretum there is probably the largest collection of species and varieties of conifers which can be found in eastern North America, although in a few collections like that at Wellesley in this state, and in the Hoopes Pinetum at West Chester, Pennsylvania, there are larger specimens of several species. Many exotic species are hardy and grow rapidly and vigorously here, but only time can tell whether any of these trees will ever reach here a large size and become permanently valuable as ornamental or timber-trees.

The most interesting thing, perhaps, which the Arboretum has taught about conifers is the fact that when a species is widely distributed over regions of different climates plants raised from the seeds of the trees growing in the coldest parts of the area of distribution of the species are the hardiest. For example, the Douglas Spruce (*Pseudotsuga taxifolia*) from the shores of Puget Sound, where this tree grows to its largest size, is not hardy here, but the same tree from the high mountains of Colorado is one of the hardiest and most promising of the exotic conifers which have been planted in New England. *Abies grandis* from the cold Coeur d'Alène Mountains of Idaho has been growing for years in the Arboretum, while the same tree from the northwest coast-region cannot be kept alive here. The same is true of the so-called Red Cedar or giant Arbor-vitae (*Thuja plicata*) of the northwest. Plants from Idaho are perfectly hardy in the Arboretum and now promise to grow to a good size, while those from the coast are tender here. The experience of the Arboretum with the Cedar of Lebanon is interesting, for this is a famous tree which it is desirable to establish wherever it can be induced to grow. The Cedar of Lebanon of European nurseries is raised from seeds produced in Europe by the descendants of the trees brought originally from the Lebanon in Syria.

Occasionally one of these trees can be seen in the neighborhood of New York and Philadelphia, but it is not hardy in New England. The Cedar of Lebanon also grows on the Anti-Taurus in Asia Minor, a much colder and more northern region than the Lebanon, and in 1901 the Arboretum had seeds collected from the trees in this northern station, and these were sown in the spring of 1902. None of the plants raised from this seed, although planted in exposed situations, have ever suffered and some of them are now from fifteen to eighteen feet high. This experiment may have important results, but a century at least will be needed to show its real success or failure.

Of exotic conifers usually planted in this country it is found that the life here of the Scotch Pine (*Pinus sylvestris*) is usually not more than thirty or forty years. The tree grows very rapidly here, it is perfectly hardy, and, beginning to produce seeds when only a few years old, self-sown seedlings often appear in considerable quantities. The so-called Norway Spruce (*Picea Abies* or *excelsa*) is another hardy, fast-growing European tree which in this climate generally begins to die at the top when forty or fifty years old and is not a success here. Experiments are being made in the Arboretum with seeds of these trees collected from wild trees in Norway and Sweden in the hope that plants raised from these seeds will be more permanent here than European nursery stock which has usually been planted in this country.

The Colorado Blue Spruce, so-called, (*Picea pungens*) promises to be a disappointment. This tree grows naturally near the banks of streams in Colorado, where it is not very common, and never forms forests or large groves; and at the end of a few years it becomes thin and scrawny, with a few short branches found only near the top of the tree. Plants up to twenty or thirty years of age in Colorado and in cultivation are symmetrical, compact and very handsome. No conifer of recent introduction has been raised in such large quantities by nurserymen here and in Europe, and few ornamental trees have been more generally planted in the last twenty years. This must be considered a misfortune, for judging by old trees in Colorado and by the oldest trees in cultivation, this Spruce cannot be for any length of time a valuable addition to our plantations. It was discovered by Dr. Parry in 1862, and one of the trees raised from seeds which he sent at that time to Asa Gray is growing on the southern slope of Bussey Hill in the Arboretum. This specimen very well shows what this tree looks like at fifty years of age. The other Colorado Spruce, *Picea Engelmannii*, although it grows more slowly, promises to be a more permanently valuable ornamental tree than *Picea pungens*; certainly as it grows in Colorado, where it once formed great forests, at high altitudes, it is one of the most beautiful of all Spruces. The trees in the Arboretum were raised here from seeds collected in Colorado in 1879 and are believed to be the finest specimens in cultivation. They are narrow, compact, symmetrical pyramids and until a year or two ago were furnished with branches to the ground; now they are beginning to lose their lower branches and therefore are losing some of their beauty as specimen trees.

It is found here that the northern White Spruce (*Picea canadensis*) grows rapidly and is very handsome for about thirty years, and then begins to become thin and unsightly probably because our climate is too warm for this cold country tree. It is found here, too, that the Red Spruce (*Picea rubra*), the great timber-producing Spruce-tree of

the northeastern United States, is rather difficult to establish and grows more slowly than any other conifer in the collection, and that the two Balsam Firs of the eastern states (*Abies balsamea* and *A. Fraseri*) are in cultivation short-lived and are of no value as ornamental trees; and that this is true, too, of one of the Rocky Mountain Firs, *Abies lasiocarpa*, and of the Siberian *Abies sibirica*.

Of native conifers in the collection, which now after a trial of from twenty to thirty years promise to be most valuable in this climate, the Rocky Mountain form of *Abies concolor* is the most beautiful at thirty years of age of all the Firs which can be grown here. *Abies brachyphylla* from Japan, with leaves dark green above and silvery white below, *Picea omorika* from the Balkans, a narrow pyramidal tree which seems to grow as well in western Europe as it does in New England, are promising trees. *Abies cilicica* from Asia Minor, *Pinus parviflora* from Japan, and *P. Koraiensis*, from Siberia, Manchuria and Korea, a valuable timber tree in its native country, are also promising. *Pinus monticola* from western America, the western representative of our eastern White Pine, is perfectly hardy here, but as an ornamental tree is in no way superior to the eastern species. *Tsuga caroliniana* from the Blue Ridge of North and South Carolina, although smaller is a more graceful and beautiful tree than our northern Hemlock. First raised from seeds in the Arboretum in 1881, it gives every promise of being one of the most desirable ornamental conifers which can be grown in this climate. The collection of the forms of the native Arbor-vitae (*Thuja occidentalis*) in the Arboretum is a large one and is now in excellent condition, and well worth a visit by any one interested in the seminal varieties some trees are capable of producing. This tendency to variation, appears, too, in the Japanese Retinosporas (*Chamaecyparis obtusa* and *pisifera*) which are planted next to the Arbor-vitae.

Although Yews are not technically conifers, it may be said that the Japanese *Taxus cuspidata* and its variety *brevifolia* have come through another winter entirely uninjured, and that there is no reason for modifying the statement already made in these bulletins, that these are the most valuable plants which Japan has contributed to New England gardens, in which the Japanese Yew seems destined to become our best hedge plant. A low form of *Taxus baccata* (var. *repandens*) has proved very hardy in the Arboretum, and for this climate appears to be the most desirable form of the European Yew.

Of trees related to the Yews the hardiest here, with the exception of the well-known Gingko-tree, is the Japanese Torreyia, *T. nucifera*. This in Japan is a large tree with a tall trunk and a dense head of dark green foliage. It should appeal to Americans as it bears the name of a distinguished American botanist, and to the student of trees it is interesting because it is the latest of all the conifers or conifer-like trees to begin its annual growth, the leaf-buds now only just beginning to expand. There is a group of these Torreyas among the Laurels at the base of Hemlock Hill, and near them is growing the largest specimen of the Japanese Yew in the Arboretum.

The Arboretum will be grateful for any publicity given these Bulletins.

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JAMAICA PLAIN, MASS.

JUNE 30, 1914

The most important summer-flowering trees, the Lindens (*Tilia*) are beginning to bloom and the fragrant flowers of the different species will perfume the air during a large part of the month of July. In the collection are the three species of the northern United States, *Tilia americana*, *T. Michauxii*, and *T. heterophylla*, all the European species, and several species from eastern Asia. Usually the trees of eastern Asia are more successful in this climate than those of the same genus from Europe, but to this general rule *Tilia* is an exception. All the European species and their hybrids and varieties flourish in New England, but the Asiatic species are showing themselves bad growers here, and only the Japanese *T. japonica* and the north China *T. mongolica* have ever grown large enough in the Arboretum to flower and produce seeds. The latter is a small and apparently short-lived tree of only botanical interest. *Tilia japonica* is also a small tree here with drooping branches and light green foliage; it is one of the late-flowering species and is conspicuous in early spring as it unfolds its leaves a week or two before those of any of the other Lindens in the collection appear.

The flowers of *Tilia platyphyllos* have been open for several days. This is the most widely distributed of European Lindens especially in the south, and it may be recognized by the yellow tinge of the leaves, by the thick covering of short hairs on their lower surface and on the leaf-stalks, and by the prominent ribs of the fruit. It is not the handsomest of the European Lindens, but it is the tree which is usually sold by American nurserymen as "the European Linden." There are varieties with leaves larger than those of the type (var. *grandifolia*), with erect branches forming a broad pyramidal head (var. *pyramidata*) and with variously divided leaves (vars. *lanceolata* and *vitifolia*). A handsomer tree, *Tilia cordata*, is the common Linden of northern Europe where it sometimes grows to a large size, the old historical Linden-trees of the north and central countries usually being of this species. This tree may be recognized by its small, thin, more or less heart-shaped leaves which are pale on the lower surface and furnished with conspicuous tufts of rusty brown hairs in the axils of the principal veins. It has not been often planted in this part of the country, although it is specially valuable, for it is the latest of the Lindens to flower and supplies bees with food after the flowers of the other Lindens have faded.

The handsomest, perhaps, of the Lindens of western Europe is by many students considered a natural hybrid between the two species already described, and is variously called *Tilia vulgaris*, *T. europaea*, *T. intermedia* and *T. hybrida*. Although widely distributed in Europe, this tree appears to be much less common than either of its supposed parents. It is a tall, round-headed tree, and large noble specimens can be found in the neighborhood of Boston where formerly it must have been more often planted than any of the other foreign Lindens.

Two Lindens occur in eastern Europe, the Silver Linden, *Tilia tomentosa*, and *T. petiolaris*. The former is a tree with erect-growing branches which form a broad, compact, round-topped, rather formal head, and erect leaves dark green above and silvery white below; this distinct-looking tree is not very common in eastern Massachusetts, but it can be often seen in the neighborhood of New York and Philadelphia. *Tilia petiolaris* is a more beautiful tree; this also has leaves which are silvery white on the lower surface, but drooping on long slender stalks they

flutter gracefully, in the slightest breeze. The branches, too, are drooping and form a narrow open head. This tree is not known in a wild state, and all the plants in cultivation have been derived from a single individual found many years ago in a garden in Odessa. A supposed hybrid of this tree with *Tilia americana* (*T. vestita*), often sold in nurseries as *T. alba spectabilis*, is one of the most beautiful Lindens with leaves of the size and shape of those of *T. americana* but silvery white on the lower surface. In Europe much attention is paid to another supposed hybrid Linden, *T. euchlora* or, as it is more generally known, *T. dasystyla*. This is a fast-growing, pyramidal tree with dark green leaves, and is now largely planted as a street-tree in Germany and Holland. It is hardy here and promises to be a useful tree in New England.

Tilia americana, which will not be in flower for several days, is a common northern tree, growing probably to its largest size along the northern borders of the United States from Nova Scotia to Minnesota, and easily distinguished by the green and shining lower surface of the large leaves which have no hairy covering with the exception of the conspicuous tufts in the axils of the principal veins. The leaves of this tree cultivated near Boston are often made brown, especially in hot dry summers, by the red spider which, however, can be controlled by spraying with arsenate of lead. *Tilia spectabilis* is believed to be a hybrid between this American tree and the European *T. tomentosa*. It is a vigorous, fast-growing tree, and holds its foliage in the autumn much later than its American parent. In some European nurseries it is sold under the name of *Tilia Moltkei*. *Tilia Michauxii* is a common tree in the northern states and is distributed from the valley of the St. Lawrence River to the mountains of North Carolina, and to Missouri and Arkansas. It may be readily distinguished by the thin covering of pale brownish hairs on the lower surface of the leaves. The third of the Linden trees of the northern states grows from western New York to northern Alabama, and through Kentucky to southern Indiana and Illinois, reaching its largest size and greatest beauty in the forests which cover the high slopes of the mountains of North Carolina and Tennessee. The leaves of this tree are larger than those of the other American Lindens, oblong in shape, very oblique at the base and silvery white on the lower surface, and, hanging on long slender stalks, the slightest breeze makes them turn first one surface and then the other to the eye. This beautiful and perfectly hardy tree appears to be rarely cultivated. The Lindens, of which there is a large collection in the Arboretum, may be seen in the meadow on the right-hand side of the Meadow Road entering from the Jamaica Plain entrance.

The collection of Grapevines on the trellises at the eastern end of the Shrub Collection is one of the most complete and important groups in the Arboretum and should be visited by every one interested in hardy vines or in seeing the decorative value of some of our native Grapevines which are still little known to gardeners. All the species of eastern North America, with the exception of two or three from the extreme south, and several exotic species are well represented in the collection and they all have decorative value.

In the Shrub Collection *Hypericum Buckleyi*, the earliest of the St. John's Worts to bloom, is now covered with its small yellow flowers. It is a dwarf plant only a few inches high, but spreads into a broad mat. In the Shrub Collection, too, the two forms of *Zenobia* are in bloom, and among *Andromeda*-like plants hardy in this climate none

produce such large and beautiful flowers. This inhabitant of the coast region of the southern United States is perfectly hardy in northern gardens.

In the Shrub Collection the European *Cytisus nigricans*, with its erect racemes of bright yellow pea-shaped flowers, is now in bloom, and this little shrub is one of the best plants of its class which can be grown successfully in this climate. The latest flowering Bush Honeysuckles, the European *Lonicera iberica*, with pale yellow flowers, and *L. involucrata*, var. *serotina* from the Rocky Mountains, with its yellow tubular corollas, are still in flower, although the fruits of some of the early-flowering plants in this group are already ripe, like the different forms of the blue-fruited *L. coerulea* and the red-fruited *L. Altmannii* from central Asia. From now until December there will be beautiful and often showy fruits on some of the Bush Honeysuckles.

Conspicuous plants now in bloom are the Silky Cornel, *Cornus Amomum*, the last of the genus to flower, and *Viburnum Canbyi*, the latest species of this interesting genus. In cultivation this shrub grows to a large size, forming a broad, round-topped bush ten or twelve feet high and flowering freely every year. The fruit is larger and ripens later than that of the other blue-fruited species. Several species of Tamarisk are now in flower and can be seen in a bed by the path in the rear of the Linden Collection where this genus has been planted. The pure white fragrant flowers of *Rhododendron (Azalea) viscosum* are open; those of *Magnolia glauca* still fill the air with delicate perfume, and the flowers of *Rhododendron maximum*, the last of the evergreen-leaved Rhododendrons to bloom, can be seen at the base of Hemlock Hill. The Sumachs are beginning to open their flowers, and many different kinds of the Burning Bush (*Evonymus*) are in bloom opposite the group of Sumachs on the Meadow Road, among them the broad-leaved form of the evergreen *Evonymus (E. radicans* var. *vegetus*) is unusually full of flowers this year and therefore will be exceptionally beautiful in autumn when its fruit ripens. Attention is again called to this plant as the best of the various forms of this Japanese *Evonymus*, which is the only perfectly hardy evergreen vine which can be grown in this part of the country.

There are still several interesting trees and shrubs to flower. Among them are the North American Sorrel-tree, *Oxydendrum arboreum*, and the North American Hercules' Club, *Aralia spinosa*. These two trees are among the Laurels at the base of Hemlock Hill. Other trees to flower are the Chinese *Koelreuteria paniculata*, with its great clusters of bright yellow flowers, *Sophora japonica*, *Maackia amurensis*, *Aralia chinensis*, and *Acanthopanax ricinifolius*, all natives of eastern Asia, and the last one of the rare trees of the Arboretum, where it is conspicuous with its great leaves like those of some tree of the tropics and large clusters of small white flowers. The Yuccas, the lovely *Clethra alnifolia* of the Atlantic coast, and *Panax sessiliflorus* from the coast of northeastern Asia, are still to flower. The Chinquapin (*Castanea pumila*) is already covered with flowers, and these in a few days will be followed by those of the native Chestnut-tree. For many weeks to come, therefore, the lover of flowers can find much of interest in the Arboretum.

These bulletins will now be discontinued until the autumn.

The Arboretum will be grateful for any publicity given these Bulletins.

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JAMAICA PLAIN, MASS.

SEPTEMBER 29, 1914

BULLETIN NO. 62.

The flowers of woody plants are not common in this climate at the end of September, but visitors to the Arboretum will still find a few interesting plants in bloom. The most conspicuous, perhaps, is the Manchurian and north China *Aralia chinensis* which can be seen in the Aralia Group near the junction of the Meadow and Bussey Hill Roads. It is a near relative of the so-called Hercules' Club (*Aralia spinosa*) of our southern woods and, like the American plant, it has stems covered with prickles, large, compound, dark green leaves, and immense clusters of small white flowers which are followed by small shining black fruits. The American plant is not quite as hardy as its Asiatic relative, but it is now well established on the margin of the woods at the northern base of Hemlock Hill in the rear of the Laurels, where it is spreading by underground shoots. The plants are just past flowering.

The Japanese *Hydrangea paniculata* and its monstrous form, on which all the flowers are sterile (var. *grandiflora*) are in bloom. The latter is one of the most generally planted shrubs in the United States, although it is a much less interesting and less beautiful plant than the still comparatively little known normal form. The two are growing side by side in the Shrub Collection. In the Shrub Collection, too, the handsome *Elsholtzia Stauntonii* is in full flower and now at its best. This member of the Mint Family, and a native of northeastern Asia, has long erect spikes of rosy pink flowers and light green foliage. One of the comparatively recent introductions of the Arboretum, it is only beginning to appear in American and European gardens. Near it in the Shrub Collection *Vitex incisa* from northern China is in flower. Although this plant is a native of a cold region the stems are often killed back to the ground here in severe winters, but as new stems grow several feet tall during the season, and as the flowers are produced on the new growth, this killing back improves rather than injures the flowering of this shrub which at this time of the year is attractive with its finely divided leaves and slender erect clusters of small rose-colored flowers. The flowers of the true Heathers (*Calluna*) have already passed but flowers may still be seen on the Cornish Heath, *Erica vagans*, and the Trumpet Creepers from the central and southern states are still producing flowers on the trellis at the eastern side of the Shrub Collection.

On the upper side of Hemlock Path, near Centre Street, small plants of *Gordonia Altamaha* are now in bloom and during several weeks will continue to open their white cup-shaped flowers which resemble those of a single-flowered Camellia. This tree is a native of southern Georgia where it was discovered late in the eighteenth century. Although often hunted for, it has not been seen growing wild for more than a hundred years, and has only been preserved by the cultivated descendants of the plants introduced by its early discoverers. This *Gordonia* flourishes in the neighborhood of Philadelphia but it is not very hardy in the Arboretum, and it is surprising that it was uninjured by the severity of last winter which destroyed so many hardier plants. On Hickory Path, near Centre Street, *Indigofera amblyantha*, which has been in flower for nearly three months, still continues to

produce its slender erect spikes of rose-colored flowers. This is one of Wilson's discoveries in western China and one of the most beautiful of the small hardy shrubs of recent introduction.

The name *Ulmus campestris* has been selected by recent writers on European trees for the Elm of the hedge rows of southern England, which was largely planted a century ago in eastern Massachusetts chiefly, no doubt, through the agency of a Major Paddock who established a nursery of this tree in Milton. The large English Elms which once flourished on Boston Common were of this species, and large specimens can still be seen in several of the Boston suburbs. The origin of this Elm is unknown. It does not produce seeds propagating itself by suckers, and is known to grow spontaneously only in some of the counties in southern England, and in a few parks near Madrid, in which it is now known to have been introduced from England many years ago. It is a noble tree, able to adapt itself to various climatic conditions, and well suited to those of New England; indeed no other exotic tree, with the exception of the European White Willow, has been here so long or grown to such a large size. Another English Elm, *Ulmus vegeta*, usually called the Huntington Elm, a supposed natural hybrid between two European species, *Ulmus nitens* and *U. glabra*, the so-called Scotch Elm, grows to a larger size than *Ulmus campestris* and is perhaps the fastest growing of all Elm trees. An Elm of this kind in the deer park of Magdalen College at Oxford, supposed to have been planted at the time of the Restoration, was blown down in April, 1911; it was one hundred and forty-two feet high, with a trunk circumference at four feet from the ground of twenty-seven feet. This was believed to be the largest tree in Great Britain and perhaps in Europe. *Ulmus vegeta* is a tree with paler bark than that of *Ulmus campestris*, large main branches spreading at narrow angles, giving the tree a vase-shaped form, rather pendulous branchlets and larger leaves than those of *Ulmus campestris*, and usually only slightly roughened on the upper surface. This tree is not rare in English parks and has been largely planted in Cambridgeshire where in the neighborhood of Cambridge there are many fine specimens. Brooklands Avenue in that city, planted with this tree in 1830, shows its value for such planting, for in all England there is perhaps not a better example of an avenue of planted trees. The Huntington Elm was certainly introduced into New England much later than *Ulmus campestris*, and probably the oldest trees here are not more than sixty or seventy years old. This Elm is perfectly hardy here, it grows with surprising rapidity, and if exotic Elms are to be planted in the United States it may well be more generally used here than it has been.

Persons interested in the plants best suited for the parks and gardens of eastern North America can find much to learn in the Arboretum from this time until the end of the year, for it is in the autumn that conifers are seen to the best advantage and that the mature leaves of the few broad-leaved evergreens which flourish in this climate best show the beauty and value of these plants for the late autumn and winter garden. Perhaps nowhere else are so many different plants with brilliant autumn foliage and handsome and abundant autumn fruits assembled; and in no other garden can such plants be so easily and conveniently studied. Such plants give a character and beauty to the autumn garden which can be found only in eastern North America, and

perhaps in Japan where the leaves of many of the native trees and shrubs assume brilliant colors before they fall.

The autumn color of a few plants is already brilliant. The earliest of the American trees to change the color of its leaves is the Red or Scarlet Maple, *Acer rubrum*. On specimens of this tree growing in swamps the leaves are now often bright scarlet, while on trees growing on higher and drier ground the leaves are still bright green or only slightly tinged with red. The so-called Water Willow, *Decodon verticillatus*, often known as Nesaea, is a native of all the region from Maine to Florida and Louisiana, and is a shrub with arching stems growing only in the wet, often submerged borders of streams and ponds where it often spreads into broad thickets. By the borders of the ponds in the Arboretum the leaves of this plant are already bright scarlet, and for a few weeks the plants will be conspicuous among the green sedges and swamp grasses with which they are associated.

The leaves of some of the forms of the so-called Virginia Creeper of eastern North America are already bright scarlet. The earliest to adopt its autumn dress and now in brilliant color is *Parthenocissus vitacea*. This plant rarely has adhesive discs at the ends of the tendrils, and therefore cannot attach itself to the trunks of trees or to brick and stone walls, like *Parthenocissus quinquefolia* which is often sold in nurseries as *Ampelopsis Englemannii*. There are many forms of the Virginia Creeper which can be seen on the trellis near the entrance to the Shrub Collection from the Forest Hills Gate.

A few of the fruits which ripen in early autumn are already conspicuous. There is perhaps no shrub more beautiful in the autumn than one of the American Cornels, *Cornus rugosa*, or, as it is sometimes called, *C. circinata*. It is a tall, broad, round-headed shrub with greenish branches and round, oval, dark green leaves; the flowers are not more showy than those of the other Cornels, but the clusters of light blue fruits on red stalks make them objects of much interest and beauty. There are a number of these plants in the Cornel Group at the junction of the Meadow and Bussey Hill Roads, and there are great clumps of it among the Hickories and in other parts of the Arboretum. The red Osier Cornel, *Cornus racemosa*, often called *C. stolonifera* or *C. candidissima*, is also beautiful at this season, for the leaves are beginning to turn dark red and the plants are covered with abundant clusters of white fruits on bright red stalks. This plant has been largely used in the Arboretum; it spreads rapidly into large, dense clusters, and with its good foliage, abundant flowers and beautiful fruits, few shrubs are more desirable for park and roadside plantations.

The fruit of some of the new Chinese Cotoneasters is handsome and the autumn coloring of their foliage is often splendid. Most of these plants are perfectly hardy, and among them are certainly some of the most valuable garden shrubs of recent introduction. They can be seen in the special Chinese Collection on Bussey Hill and in the Shrub Collection, and deserve study with reference to the autumn garden.

The Arboretum will be grateful for any publicity given these Bulletins.

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BULLETIN NO. 63.

In spite of the severity of the past winter and the injury which it caused, and of the drought of September and October which has been of exceptional length, the Arboretum on the whole does not look bad, and for lovers of plants there is much of interest to be seen here this year in the early weeks of November. The conifers, with few exceptions, are in good condition, although the leading shoots of a few species have been destroyed by a borer, the White Pine Weevil (*Pissodes strobi*). The species which are injured by this pest nearly every year in the Arboretum are the Himalayan White Pine (*Pinus excelsa*), the White Pine of western China (*Pinus Armandi*), the Oriental Spruce (*Picea orientalis*), and the Balkan Spruce (*Picea omorika*). The Balkan Spruce is the last European tree brought into cultivation; it is a beautiful, fast-growing and perfectly hardy tree which on the mountains of southwestern Europe sometimes grows to a large size and is highly valued as a timber tree. In this country, or at least in the Arboretum, it does not promise to become valuable as an ornamental tree unless the ravages of the White Pine Weevil can be stopped. There is no indication yet that many of the new Chinese conifers, especially the Pines and Spruces, will not flourish in this climate. The Larches are perhaps less promising, and the Firs, although some of them may prove hardy, grow badly in the nursery and do not give promise of much value here.

A few of the conifers in the Pinetum which are particularly interesting just now are the Colorado White Fir (*Abies concolor*), the Japanese *Abies brachyphylla* and *A. homolepis*, the Carolina Hemlock (*Tsuga caroliniana*), and three Japanese Pines, *Pinus parviflora*, *P. Thunbergii*, and *P. densiflora*. There are good plants of a dwarf form of the last in the collection of dwarf conifers to which attention is called. This dwarf is a common plant in Japanese gardens and should be better known in this country, for it is one of the handsomest of all dwarf conifers among which are many decorative garden plants. Among other conifers which should be studied at this time are Engelmann's Spruce (*Picea Engelmannii*), the Colorado form of the Douglas Fir (*Pseudotsuga mucronata*), the Siberian Spruce (*Picea obovata*), the western White Pine (*Pinus monticola*), the different forms of the Black Pine of Europe (*Pinus nigra*, *laricio*, etc.), and some of the eastern North American Pines, notably *Pinus resinosa*, *P. virginiana*, and *P. Banksiana*.

The few broad-leaved evergreens which can be grown successfully in this climate are in good condition, and Laurels (*Kalmia*) and all Rhododendrons now promise abundant flowers for next year. The evergreen Hollies are beautiful now. *Ilex opaca* is covered with its large red berries and is interesting because it is the only broad-leaved evergreen tree which is hardy in the Arboretum. Although less beautiful than the European Holly with its lustrous leaves, it should be more often seen in eastern American collections in which north of Washington the European tree is not hardy. The native Inkberry (*Ilex glabra*) is one of the most valuable of the evergreen shrubs which can be grown in this climate. It is a round-topped plant, occasionally five or six feet tall, and is very common in the neighborhood of the coast from New

England to Texas. As an ornamental plant it is chiefly valuable for its small shining leaves which nearly completely hide the small black fruits which remain on the branches during the winter. A large mass of this Holly can be seen on the Bussey Hill Road opposite the Laurels at the northern base of Hemlock Hill. Only one other Holly with evergreen leaves has proved hardy in the Arboretum. This is the Japanese *Ilex crenata*, which is a taller growing and narrower plant than *Ilex glabra*, with darker green leaves and larger black fruits. There are several of these Hollies on the lower side of Azalea Path.

Several shrubs are more beautiful now than at any other season of the year, especially those with showy fruits which retain their leaves late into the autumn with little or no change of color. Among such plants not one perhaps is more beautiful than the common European Privet (*Ligustrum vulgare*) which has been cultivated for centuries and has become naturalized in the eastern United States. This plant bears at the ends of the branches large clusters of shining black berries which now make a fine contrast with the dark green leaves. The European Privets are in the Shrub Collection where they are planted with a number of Asiatic deciduous-leaved species, to all of which they are superior as decorative plants at this season of the year.

There are few more beautiful shrubs in the Arboretum at this time than the variety (var. *podocarpa*) of the eastern Asiatic *Lonicera Maackii* which was discovered by Wilson in western China, for its leaves are still green and perfectly fresh, and its branches are covered with bright red fruits. This is a large, vigorous, fast-growing, and perfectly hardy shrub with wide-spreading branches and requires a good deal of space in which to show its real beauty. From the northern *Lonicera Maackii*, a native of the Amoor region, the leaves have mostly fallen, but the erect growing branches are covered with scarlet fruits. The flowers of the northern plant are pure white and larger than those of any other Bush Honeysuckle.

Photinia is a genus of the Rose Family related to the Apples, with a few species of small Asiatic trees. Two of these plants, *Photinia villosa* and its variety *laevis*, thrive in the Arboretum and may now be seen in the Shrub Collection covered with their small red fruits. These little trees succeed perfectly in this climate; their small white flowers are freely produced in spring in many-flowered clusters, and their fruit remains a long time on the branches, especially that of the variety, from which it sometimes does not entirely disappear until the end of winter. This plant has been largely planted in the Boston parks, and several good specimens can be seen along the borders of the Francis Parkman Road.

The trees and shrubs of Japan usually retain their leaves later than the related American species, and as the leaves of many Japanese plants take on brilliant colors in the autumn they are valuable for prolonging the beauty of the autumn garden. It is interesting to find that this late changing of color is common also among many of the plants of western China. This is particularly noticeable in the new species of *Cotoneaster* discovered by Wilson. The leaves of nearly all these plants are still perfectly green, and probably by the middle of November they will be bright scarlet, or in some species scarlet and orange. These plants have late ripening, red or black fruits which greatly add to their beauty, and among them are certainly some of the most val-

uable shrubs of recent introduction. There are now many good specimens of these Cotoneasters on Bussey Hill and they deserve the attention of all lovers of hardy plants, especially *Cotoneaster divaricata*, *C. foveolata* and *C. Dielsiana*, the leaves of which turn brilliant colors, and the different forms of *C. horizontalis*, low shrubs with wide-spreading nearly prostrate branches. These have small lustrous leaves which in this climate do not fall before Christmas, and small red berries. No shrubs are better suited for the decoration of the rock garden.

Among the American Hawthorns which show their greatest beauty in November may be mentioned *Crataegus cordata*, *C. nitida* and *C. persistens*. The first of these plants, the so-called Washington Thorn, is a narrow, slender tree, which sometimes attains the height of twenty or thirty feet. The flowers are small, creamy white, and do not open here until nearly the middle of June, and the small, scarlet, shining fruits, which ripen late in October, remain on the trees without much change of color until the spring. As the fruit begins to show its bright color the small triangular leaves turn to shades of orange and scarlet. *Crataegus nitida* is a native of the bottom-lands of the Mississippi opposite the city of St. Louis; it is a large tree with slightly spreading pendulous branches forming a large, open, round-topped head. The leaves are narrow, long-pointed and very lustrous; the flowers are pure white, of medium size, and produced in numerous clusters which cover the upper side of the branches. The scarlet drooping fruit, which is also of medium size, ripens late just as the leaves turn orange and scarlet. This is one of the handsomest of the American Hawthorns and has grown to a large size in the Arboretum. *Crataegus persistens* retains its leaves, which are now as green as they were in mid-summer, after those of all other Hawthorns have fallen, and the crimson fruit remains on the branches until spring, making this tree in winter the most conspicuous of the deciduous-leaved plants hardy in New England. It resembles in the shape and in general appearance of the leaves some of the Cockspur Thorns of eastern North America. Raised many years ago at the Arboretum from seeds received from the Paris Museum, its native country is still unknown. The largest plant of this tree in the country, and the type of the species, can be seen among several large Hawthorns at the foot of the bank on the pathway near the Forest Hills entrance to the Arboretum, where it is now the only plant with perfectly green leaves.

The only shrub now in flower in the Arboretum is the Witch Hazel of the northern states (*Hamamelis virginica*) which is covered with its yellow flowers.

These bulletins will now be discontinued until spring.

The Arboretum will be grateful for any publicity given these Bulletins.

